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JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTY-FIRST ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN ASHEVILLE, N. C., DURING THE WEEK OF SEPTEMBER 3, 1923.

The 1923 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Asheville during the week of September 3.

For Association Roster see pages x, xii, xiv, and xv.

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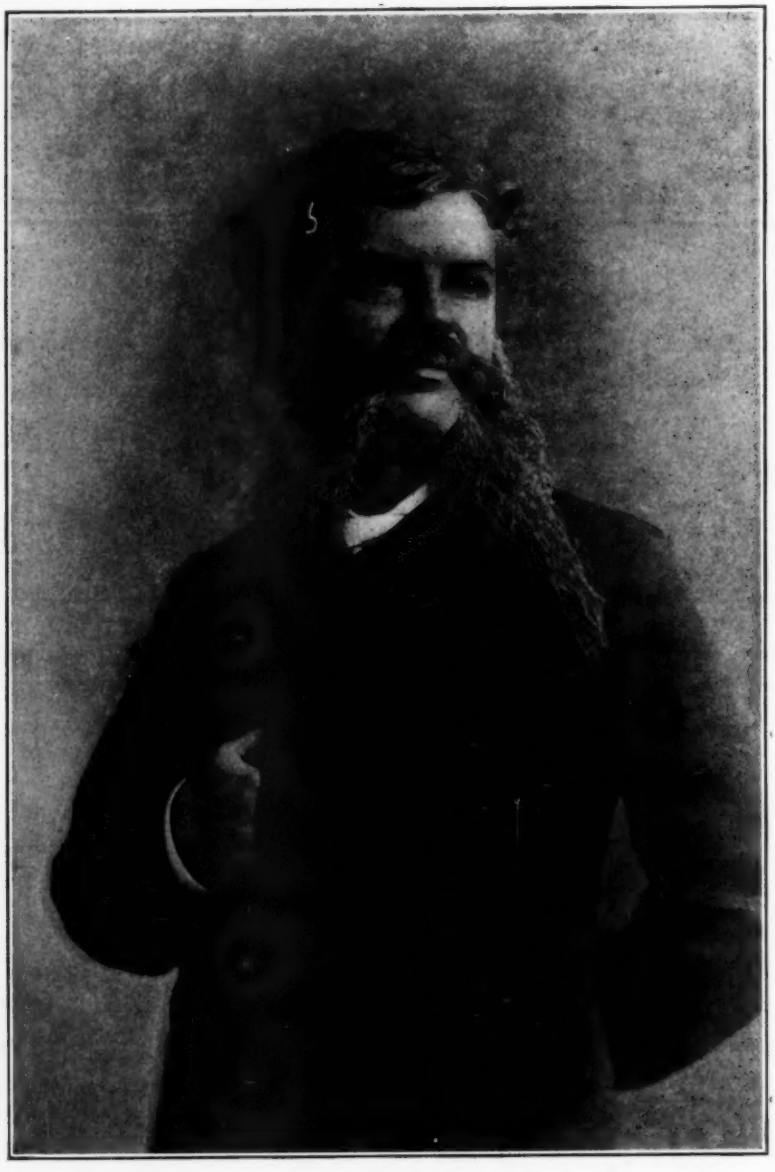
WILLIAM SIMPSON

1839–1905

RALEIGH, N. C.

Forty-second President of the American Pharmaceutical Association, 1894–1895



WILLIAM SIMPSON.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XII MAY, 1923 No. 5

WILLIAM SIMPSON.

William Simpson, the forty-second president of the American Pharmaceutical Association, was born of Scotch parentage in New York City on May 21, 1839. He died in Raleigh, North Carolina, on June 23, 1905, at the age of sixty-six years.

Though born in New York, Mr Simpson's entire life was spent in the South. His family moved to Richmond, Virginia, when he was five years of age and thence to Warrenton, North Carolina, when he was sixteen. With the latter State, of which he remained a citizen until his death, his career is associated. In Warrenton, when he was just approaching manhood, he began the study of pharmacy, his life-work, under the tutelage of Mr. Ferguson, a local druggist. This study was greatly interrupted at first for the reason that it devolved upon Mr. Simpson at the age of seventeen to assume the responsibilities of his father whose health was failing rapidly. For some years in Warrenton, and then in Raleigh to which city the family moved, he managed a bakery established by his father, and it was in this wise that a livelihood was provided for the family. His evenings, however, were always given over to a study of pharmacy, and he had secured a working knowledge of the subject when in 1856 or 1857 he moved back to Richmond for a time and became employed in a drug store at the corner of Broad and Twenty-fifth Streets. For the next few years Mr. Simpson's study of pharmacy was very intensive and his later writings and teachings prove that it was thorough. In the late fifties he was for a short time employed by Meade and Baker, manufacturing pharmacists, of New York.

On October 15, 1860, Mr. Simspon was married to Miss Anna Cannon Shanks, of Richmond, Va., and immediately moved with his wife to Raleigh, N. C., where he remained until his death. In 1861, a year after coming to Raleigh to live, Mr. Simpson volunteered in a Virginia regiment of the Confederate Army, but the government, recognizing his fitness for a branch of service requiring pharmaceutical skill, detailed him for duty in the military hospitals at Raleigh. He also had certain duties to perform in connection with the commissary department.

In 1867 Mr. Simpson bought a partnership in the firm of Doepp and Jones,

druggists, and by 1870 had purchased the entire stock. Thus began his career as a retail druggist in Raleigh—a work continued until two years before his death. During the thirty-eight years that Mr. Simpson was a retail druggist there were two qualities that characterized the policy of his business. One was unfailing cordiality toward customers and the other was the supply of medicines without charge to the poverty-stricken sick of the community. That his store had a reputation also for reliable prescription service may be taken for granted.

In 1880 Mr. Simpson was one of the leaders in the formation of the North Carolina Pharmaceutical Association, and, together with five other druggists, was named in the first Pharmacy Act of 1881 as an incorporator of the Association. At the first meeting of this organization held in Raleigh on August 11, 1880, Mr. Simpson was elected second vice-president. The following year he was advanced to first vice-president, and in 1882 to the presidency. At the organization meeting above mentioned he was appointed a delegate to the twenty-eighth annual meeting of the American Pharmaceutical Association held at Saratoga Springs, N. Y., September 14, 1880. During the progress of this meeting in which Mr. Simpson took an active part in debate he was elected third vice-president of the organization. From that time until his death he displayed keen interest in the affairs of the Association and often had a leading part in its conduct. This interest and intelligent activity was rewarded in Asheville, N. C., on September 3, 1894, by his election as the forty-second president. The annual meeting of the American Pharmaceutical Association over which Mr. Simpson presided was held at Denver in 1895. His presidential address had education as its keynote, and in the message he urged not alone thorough technical training for pharmacists but stressed the importance of sound high school preparation as a prerequisite to licensure.

The emphasis laid on education in his address was characteristic of his career in North Carolina. An opportunity was never lost by him to stress the value to druggists and the importance to public health of careful, thorough, and systematized training for pharmacists. Shortly after the enactment of the law in North Carolina making mandatory the passage of an examination before incoming druggists could practice their profession, and before there were any schools of pharmacy in his own or neighboring States, Mr. Simpson began the work by which he is best remembered and which gives him a lasting place in the history of pharmacy in North Carolina. Reference is made to his contribution as a teacher. First that his own clerks might be assisted in passing the examinations of the State board, then that other clerks in Raleigh might be helped, and finally, as his instruction was advertised, that he might extend his usefulness to a larger field, Mr. Simpson began and continued a school of pharmacy that was unique in its conduct but highly successful in its results. From the early eighties until within a year and a half of his death hundreds of candidates for license as pharmacists were enrolled as his students and benefited by the brief but intensive and thorough schooling that Mr. Simpson was famed for giving.

Although his teaching was at first confined to his own school and his own race, his ability as an instructor was later recognized by his appointment in 1893 as the Dean of the Leonard School of Pharmacy of Shaw University, a negro institution of Raleigh, officered by white people and noted for the thoroughness of its instruction.

Mr. Simpson was appointed a member of the first board of pharmacy in North Carolina, and by this board elected to the post of secretary. From 1881 until the summer of 1902, a period of twenty-one years, Mr. Simpson acted as secretary and treasurer of the board of pharmacy, and even until his death in 1905 he continued to serve as one of the examiners. But failing health and an impaired vision which finally became total blindness caused him to relinquish one by one the duties and responsibilities he had assumed. The tedium of his executive position as secretary of the board caused him to resign that work first of all. Even so, his twenty-one years of continuous service was the longest at that time of any similar officer in the United States.

It is dangerously easy for a biographer to exaggerate the goodness or greatness of his subject, and hard for him to analyze coldly and report in unprejudiced vein. However, a student of Mr. Simpson's career is presented with so many clear-cut evidences of genius, achievement, kindliness, benevolence and graciousness that he need not invoke his own enthusiasm in order to paint a pleasant picture. It has often been remarked that no person needing medicine ever left Simpson's Drug Store without it for lack of money, and it was this charitable impulse on the owner's part that kept him from attaining the financial success he might otherwise have enjoyed. Another quality that endeared him to people was the genuine courtesy that was inherent in his nature. Nothing perhaps was so characteristic of Mr. Simpson as the cordiality of his smile, the heartiness of his hand-clasp, the unaffected friendliness of his manner. Not even total blindness which developed about two years before his death could change the kindliness of the man or rob his nature of its brightness. At first gradually and then rapidly Mr. Simpson's health failed and in 1905 he died from the effects of brain tumor.

Thus William Simpson lived his life, possessed of the confidence of associates and the love of friends; earned by repeated proofs of sincerity and acts of devotion; comforted with the knowledge that into the work to which he had dedicated his life had gone the very best he had to give and rewarded with evidence that this best was splendid achievement.

J. G. BEARD.

CHAPEL HILL, N. C.
APRIL 23, 1923.

NEEDLESS NAGGING OF BUSINESS.

An editorial of a recent issue of the *New York Commercial* states:

"Out of thirty-three cases brought by the Federal Trade Commission in the United States Circuit Court of Appeals, its cease and desist orders have been reversed in twenty-four instances and enforced in four proceedings. In other words, it loses four cases for every one that it wins. Out of eight cases taken into the Supreme Court, the Commission's orders have been reversed six times, which means the ratio of four to one. Put in another form this means that for every case in which the Federal Trade Commission has been able to force a business concern to amend its practice, four other concerns have been subjected to the annoyance and expense of long-drawn-out litigation to protect themselves against the fanatical orders of the Commission. Nor does it follow in the cases that have been affirmed that any serious public loss was likely to be encountered. In fact, in practically every case the courts were divided, so that the question was a debatable one in the end. That being so, there was no great public suffering or hardship either way."

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

THE NATIONAL ANTI-NARCOTIC CONFERENCE.

AT the time of this writing we are only advised in a general way relative to the Anti-Narcotic Conference in Washington, May 2–4. No one will question the need of continued watchfulness relative to illegitimate transactions relating to narcotics, nor of the closest supervision over all manufacture and sales of them—the seriousness of addiction cannot be too forcibly impressed. It is a subject that concerns all citizens, whether they are charged with the duty of dispensing narcotics or not. The educational viewpoint should be emphasized, so that those who are tempted may be informed regarding the consequences of the habitual use of narcotics. For the illegitimate sellers, the bootleggers and their kind there can hardly be any sympathy. They are criminals of the worst type and about the only thing that can be done with them is to ferret them out and place them where they must desist from destroying morals and life. The unfortunate habitues are entitled to charitable consideration.

States and municipalities are gradually coming to a better understanding relative to the treatment of addicts—that institutional environments of those committed should, as far as possible, bring the unfortunates to a higher concept of right thinking and right living. These habitues will in most instances, in due course of time, under proper care and medical treatment suffer no inconvenience from withdrawal of the narcotic. But this is only the first step for permanently restoring the addict to normal life; the more important effort and duty is to awaken a determination in him to become a useful citizen, displace the habit that has held him—right encouragement is a strong factor. The methods that have too generally been followed are not conducive to this end—in that connection the coöperation of officials and of all citizens is essential. This is a subject that is being given more careful study, and with the application of methods which will give the unfortunates better opportunities and improve their surroundings, while confined, more permanent cures will result. It is to be hoped that the narcotics under consideration will eventually be supplanted by agents that do not induce addiction—to some extent this has been accomplished.

The legitimate manufacture and dispensing of narcotics is well in hand in this country; it is the illegimate traffic that constitutes a serious menace—the big proposition is to stop smuggling and illegimate selling. These comments are introduced because of the statement made at the beginning—that we are not fully advised at the time of this writing, relative to the purposes and conclusions of the Conference in Washington.

Congress has asked President Harding to urge foreign governments in whose territory opium and coca leaves are produced to restrict production to an amount necessary for medical and scientific supplies of the world. It is understood that

the United States will have representation at the Geneva Conference in support of this humanitarian purpose, which will enable all countries to control the traffic in narcotics more effectively and, essentially, confine their uses to legitimate purposes "—'tis a consummation devoutly to be wished." E. G. E.

THE GRADUATES OF PHARMACY COLLEGES AND SCHOOLS.

COMMENCEMENT season is with us—the schools and colleges of pharmacy will honor many young men and women with credentials, testifying to their qualifications for the practice of pharmacy. The endorsements signify that these graduates have completed the course prescribed by the institutions from which they pass—that they have been prepared by study, practical experience and observation for the work in which they will engage. Society accepts the credentials with assurance that these young men and women will not disturb or destroy its welfare by their actions—that they are competent pharmacists.

The graduates of schools of pharmacy have had the greater present-day advantages for studying pharmacy. The schools have selected their matriculants from among those qualified by advanced preliminary educational attainments and high character recommendations. The almost universal esteem in which patrons hold the owners of the drug stores where they trade and have medicines prepared is a commendation in which we have pardonable pride. It is a source of greatest regret, therefore, that there are some, however, few, who lend themselves to questionable transactions—no trade or profession is entirely free from delinquents. In this connection *The Pharmaceutical Era*, in a recent number, closes an editorial "To Those about to Graduate" with the following admonition:

> "Above everything else the young graduate should look out for the man who approaches him with the proposition to start a new store. The situation should be gone into very carefully, and no matter how alluring the prospect may be, if liquor is to be sold unlawfully, or even within the law if criminal intent is apparent, as it often is, the opportunity should be treated in just exactly the same manner that an invitation to contract leprosy should be. No young man can afford to jeopardize his future by entering into such an arrangement, for he has a long life before him, and the best way to live it is to go straight.
>
> "Getting started is important. A young man is so constituted that he doesn't like to take advice, but—well, let us repeat: in a measure the destiny of pharmacy is in the hands of the classes of '23."

It is to be hoped, and it is expected, that the young men and women about to graduate will comprehend and exemplify in their business life the ideals of pharmacy adapting the words of Prof. C. A. Dye, as president of the American Conference of Pharmaceutical Faculties, they should not lose sight of the fact that "the long and honorable history of pharmacy has been due to men of ideals and always a vision for the future." They should be loyal to their *Alma Maters*, to whom they owe allegiance, and give these institutions encouragement and support, for their achievements reflect credit on the alumni. E. G. E.

RESOLUTIONS OF THE ANTI-NARCOTIC CONFERENCE IN WASHINGTON.

AFTER the editorial in this issue of the JOURNAL was written, the resolutions as amended and, thereafter, adopted by the Anti-Narcotic Conference in Washington have appeared in print, whole or in part. The following are reprinted from a report in the press:

Resolved, That this conference calls upon the pulpit, the press, and all educational and welfare organizations to realize the impending danger to the youth of the world; that all such forces join hands in suppressing this evil addiction and the fiendish traffic in soul-destroying narcotics, and that the evil effects of narcotics be taught in our schools; and

Resolved, That it is the sense of this conference that municipal ordinances, state and federal statutes be enacted and strengthened, and with a greatly increased field force effectively administered: and

Resolved, That the President of the United States be commended for sending abroad a commission pursuant to the Porter resolution, for the purpose of securing unified, world-wide action in ascertaining the world requirements of narcotics for medicine and science, and that specific agreement of all the nations be secured to limit the growth of the poppy and coca plants, and the manufacture of morphine, cocaine and their derivatives to the medical and scientific needs; and

Resolved, That this conference endorses the conclusion that medical use should be considered the only legitimate use of opium, and that all non-medical use should be regarded as an abuse, and that the use of opium as a stimulant cannot be considered legitimate even in tropical countries; and

Resolved, That in the opinion of this conference, if the Opium Advisory Committee, sitting in Geneva, reaches the conclusion that the Opium Convention of 1912 is not sufficiently adapted to meeting effectively the problem of restricting cultivation at its source, that convention should forthwith be amended, and

Resolved, That a copy of these resolutions be personally presented by Chairman Kober to Warren G. Harding, President of the United States.

These resolutions present the thoughtful consideration of the body.

The seriousness of the menace has been discussed in an editorial of this issue of the JOURNAL, which expresses some of the writer's thoughts on the subject and, therefore, no further comment is made at this time. E. G. E.

REORGANIZATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

It need not be stressed that the pages of the JOURNAL are always open to the members, and expressions on the question of reorganization are most welcome prior to the annual meeting for the guidance of the Executive Committee. Without such direction the members of the Committee must be guided by their views and their interpretation of what is desired by the members of the Association. "Wisdom does not so much consist in knowledge of the ultimate; it consists in knowing what to do next."

In the April issue of the JOURNAL, p. 291, Chairman E. F. Kelly presents the subject as an editorial; under Committee Reports, p. 365, of the same number a communication addressed to the State Associations is printed under the caption of "The Need for a More Thorough Organization of American Pharmacy," and under Societies and Colleges, p. 371, the advantages under the proposed plan of

reorganization are outlined by the Chairman of the House of Delegates, A. Ph. A. Ex-President A. R. L. Dohme has contributed an article for this number of the JOURNAL, and a communication from H. A. B. Dunning follows. E. G. E.

AN ORGANIZATION REPRESENTATIVE OF ALL PHASES OF PHARMACEUTICAL INTERESTS NEEDED.

I have been urged to express my views on the present plan for the reorganization of the American Pharmaceutical Association and I am doing so with some hesitancy, on account of not having been as intimately associated with the work of our Association in recent years as formerly. I am, therefore, not thoroughly conversant with the progressive steps which have been made and have resulted in the present seriously considered plan of reorganization. I am also not duly qualified to criticise constructively the details of this definite plan for reorganization. I am referring to the plan clearly discussed and analyzed in the September 1922 issue of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in an editorial by E. F. Kelly. However, it seems to me that this plan might be made more simple and more direct, but I understand the difficulties involved in adjusting any plan so that it will be acceptable to a number of people having different views and I, therefore, endorse this plan accepted by the American Pharmaceutical Association membership at their last meeting, as the first step toward an effective reorganization of our Association. I have expressed myself indefinitely respecting the details of reorganization of our Association, but I have no doubt of the necessity of an immediate reorganization if the Association expects to remain effective. It is true that pharmacy and those interested in pharmacy need, at this time, as never before, an organization representative of all phases of pharmaceutical interests and representative of the full strength of those interests. This is the opportunity of the American Pharmaceutical Association.

At present, our forces are divided, as are our interests. We have a strong National Association of Retail Druggists, Manufacturing Druggists and Wholesale Druggists, but no organization that represents the entire interests, influence and force of all these organizations. It is splendid to note that the retailers, wholesalers, manufacturers, state associations and all pharmaceutical bodies now in existence and active, are interested and willing to coöperate in the reorganization of the American Pharmaceutical Association so that it will be representative of all phases of pharmacy and will exercise its influence for the betterment of pharmacy, will act as a force for its protection and will serve humanity more effectively. As a retail, wholesale and manufacturing pharmacist, as a member of my state organization, as a long-time member of the American Pharmaceutical Association, I urge the members of all State associations and the members of the American Pharmaceutical Association to keep up their active interest in carrying through the new plan of reorganization until it is effected. American pharmacy needs, more than anything else, for its welfare, an organization consisting of many thousands of members distributed throughout this great country, rather than a few thousands. The improvement of the organization can and will come afterward.

H. A. B. DUNNING.

A CHEMICAL METHOD FOR THE ASSAY OF STROPHANTHUS PREPARATIONS.*[1]

BY ARTHUR KNUDSON AND MELVIN DRESBACH.

In continuation of work recently reported by us (1) on a chemical method of assaying digitalis preparations, it was thought that it would be of interest to see if a similar method could be applied to the assay of strophanthus preparations. Most of the methods employed at the present time in assaying the latter are biological, identical with the biological methods for the assay of digitalis.

Numerous chemical methods have been reported for the assay of strophanthus preparations, and they are based mainly on the extraction of the glucosides from the preparation and weighing the residue. Some of the chemical methods suggested convert the strophanthins into strophanthidin by acid hydrolysis; the strophanthidin, which is more insoluble and more easily crystallized than the strophanthins, is then weighed. A comparative study of most of these methods and results given by them was made by Lampart and Meuller (2). The objection to all of them is that they are tedious, requiring a number of procedures with chances for large sources of error, especially due to the small amount of active principle separated and to the possibility of other substances being present.

It will be of interest to review briefly the present conditions of strophanthin chemistry. Three varieties of strophanthus are found in commerce—*Kombé*, *hispidus* and *gratus*, two of which, *Kombé* and *hispidus*, are official. From *strophanthus Kombé*, Brauns and Clossen (3) have isolated a crystalline glucoside, known as crystalline Kombé strophanthin. It melts at 178–179°, contains water of crystallization and its composition conforms to the formula $C_{41}H_{56}O_{15}.3H_2O$. This product separates directly when a decolorized 70% alcoholic extract of drug is concentrated. The crude drug contains in larger quantity an amorphous strophanthin. When a water solution of the crystalline Kombé strophanthin is evaporated at moderate heat to a small volume it is converted into acid amorphous strophanthin. The crystalline, amorphous and acid amorphous strophanthin Kombé upon hydrolysis with dilute acid are converted into crystalline strophanthidin ($C_{23}H_{32}O_7$), which is very easily crystallized and isolated. From *strophanthus hispidus* no crystalline glucoside has been isolated, but Heffter and Sachs (4) have obtained an amorphous product called *h*-strophanthin. This product upon hydrolysis with dilute acid yields the same strophanthidin that is obtained from Kombé strophanthins. From *strophanthus gratus* a crystalline glucoside called gratus strophanthin, or ouabain, is obtained (5). It contains water of crystallization and conforms to the formula $C_{30}H_{46}O_{12}.9H_2O$ (water of crystallization may vary from one to nine molecules). Gratus strophanthin has been found present in a number of varieties of seeds (6). It is not converted by hydrolysis into crystalline strophanthidin as are the principles from the other varieties.

EXPERIMENTAL.

In our chemical method for the assay of digitalis principles (1) we made use of the reaction reported by Baljet (7). Baljet observed that cardiotonic glucosides,

* Received for publication April 9, 1923.

[1] A preliminary report appears in the proceedings of the Society for Experimental Biology and Medicine (A. Knudson and M. Dresbach, *Proc. Soc. Exp. Biol. and Med.*, XIX, 389, 1922). The complete report was presented before the American Society for Pharmacology and Experimental Therapeutics, in Toronto, December 1922.

whether from digitalis or strophanthus, give an orange-red color when added to a dilute alkaline picrate solution. We compared a number of purified strophanthin preparations quantitatively by this color reaction, using a solution of ouabain as a standard. The results of these tests are given in Table I.

TABLE I.—QUANTITATIVE COMPARISON OF DIFFERENT STROPHANTHINS WITH THE ALKALINE PICRATE REAGENT.

Specimen No.	Kind of preparation.	Ouabain used as standard. Mg. = 0.100 mg. Ouabain.
7	Amorphous strophanthin, Merck	0.135
50	Crystalline Kombé strophanthin, P., D. & Co.	0.100
52	Amorphous Kombé strophanthin, P., D. & Co.	0.164
53	*g*-Strophanthin, Merck	0.100
54	Amorphous strophanthin, U. S. P. IX, Merck	0.124
55	*h*-Strophanthin, Merck	0.101
56	Acid amorphous strophanthin (?)	0.149
57	Amorphous strophanthin, U. S. P. IV, Merck	0.131
58	Amorphous strophanthin, U. S. P. IX, P., D. & Co.	0.157

Upon examining this table, it is interesting to note that equal amounts of the *Kombé*, *gratus* and *hispidus* strophanthins react with the same intensity of color and that the amorphous strophanthins obtained from various sources vary in their reaction. All of these amorphous strophanthins are supposed to be prepared from Kombé seeds, and the fact that they vary in their activity may indicate that they contain some inert impurity and that with our present methods it is not possible to isolate them in a pure crystalline form. In this table it will also be noted that the preparation No. 56, acid amorphous strophanthin, reacts about fifty per cent. weaker than the crystalline Kombé strophanthin. This preparation was made from the crystalline Kombé strophanthin by a method suggested by Brauns and Clossen (3). Due to the fact that our supply of crystalline Kombé strophanthin was very limited, only enough of this material was prepared for our chemical and biological assay. No other tests could be carried out on it and we are therefore hesitant about calling this acid amorphous strophanthin. Since the crystalline Kombé strophanthin, *g*-strophanthin or ouabain, and the *h*-strophanthin react quantitatively the same to the alkaline picrate solution, a method was suggested by which we could quantitatively measure the amount of glucosides present in the strophanthus preparations, using either crystalline Kombé or *g*-strophanthin as a standard. Briefly, the method consists of decolorizing the strophanthus preparations with lead acetate solution, removing the excess lead and treating the decolorized solution with the alkaline picrate reagent. The intensity of color and the amount of strophanthin glucosides in the preparations can then be calculated.

SOLUTIONS NEEDED.

The solutions used in this method are the same as reported for digitalis (1), *viz.*:

a. A 10 per cent. solution of neutral lead acetate.

b. A 10 per cent. solution of Na_2HPO_4.

c. Alkaline picrate solution. This solution is prepared by mixing 95 cc of a 1% purified picric acid solution with 5 cc of 10% sodium hydroxide. The picric acid and sodium hydroxide can be made up as stock solution and the alkaline picrate freshly prepared as needed.

d. As a standard for comparisons, it is convenient to employ the same standard as used for digitalis assay (1). This standard used by us is a solution of crystalline ouabain[1] containing 0.266 mg. per 5 cc of water. Five cubic centimeters of this solution are added to 5 cc of alkaline picrate solution. If testing only strophanthus preparations, a stronger standard can be used containing 0.5 mg. per 5 cc of water. Using the stronger standard simplifies the calculation.

e. The permanent standard as suggested for digitalis assay (1) can also be used in this method. This is prepared by dissolving 3.44 Gm. of pure potassium dichromate in water and making up to a liter. The color of the solution set at 20 mm. in a colorimeter is equal to the color given by 5 cc of ouabain solution containing 0.266 mg. when mixed with 5 cc of the alkaline picrate solution.

PROCEDURE.

Two cubic centimeters of a tincture of strophanthus,[2] or an equivalent amount of drug in the form of an infusion, are measured into a 25-cc volumetric flask and diluted with water to about 15 cc. To this 2.5 cc of lead acetate solution are added, contents mixed, and then diluted with water to the mark. After mixing thoroughly and allowing to stand a minute, the solution is filtered; 12.5 cc of the filtrate are then measured into another 25-cc volumetric flask and 1.25 cc of Na_2HPO_4 solution are added in order to precipitate the excess lead. The contents of the flasks are then diluted to the mark, mixed thoroughly and filtered. The filtrate should be clear and colorless. Transfer from 1 to 5 cc to a 10-cc volumetric flask or tube graduated at 10 cc and at the same time transfer 5 cc of the standard ouabain solution to another volumetric flask. To both of these flasks add 5 cc of the alkaline picrate solution, bring the volume to 10-cc mark if necessary, mix, and allow to stand at least twenty minutes; then make color comparison in colorimeter, setting the standard most conveniently at 20 mm. The color comparison should be made between twenty and thirty-five minutes after the alkaline picrate has been added, so that it is never advisable to develop the color in more than three to five specimens at a time. Instead of the standard ouabain solution the permanent standard of potassium dichromate solution mentioned above can be put in the colorimeter, set at 20 mm. and the unknown specimen compared with it after the color has been allowed to develop in the manner described.

CALCULATION.

The calculations are similar to those which pertain to any colorimetric procedure. The standard contains 0.266 mg. of ouabain. The depth of the standard (in mm.) divided by the reading of the unknown $\times$ 0.266 mg. gives in terms of ouabain the number of mg. of strophanthin in an aliquot part of preparation taken. From this result calculations can be made as to the number of mg. per cc of tincture or other solution that may have been used. If, for example, 1 cc of decolorized filtrate of a tincture were used in the test, 1 cc of filtrate is equal to 0.04 cc of the

[1] We have used throughout our work crystalline ouabain as the standard but would prefer to use crystalline Kombé strophanthin if it could be obtained. The crystalline ouabain may contain from one to nine molecules of water of crystallization and preparations on the market have been shown to contain varying amounts of water. In all of our work we have used a ouabain containing nine molecules of water of crystallization.

[2] For tests on active principles of strophanthin such amounts are taken for the test as would be equivalent in activity to the standard. Also, in the case of pure principles of strophanthin the preliminary procedure of decolorization can be omitted.

original tincture. If the reading of unknown is 21.8 against standard set at 20 mm., then the calculation would work out as follows:

$$\frac{20}{20.8} \times 0.266 = 0.244 \text{ mg. in } 0.04 \text{ cc of tincture.}$$

Then in 1 cc there is 25×0.244 mg., or 6.10 mg. of strophanthin, calculated in terms of the standard, which is ouabain.

RESULTS AND DISCUSSIONS.

Several tinctures and infusions were tested by the above method and the results are given in Table II.

TABLE II.—CHEMICAL ASSAY OF STROPHANTHUS PREPARATIONS.

Spec. No.	Kind of preparation.	Strophanthin in terms of ouabain as standard. Mg. per cc.
34	Tincture, seeds unidentified	1.662
42	Tincture, seeds unidentified	1.495
44	Tincture, seeds unidentified	5.600
45	Tincture, hispidus seeds	5.920
46	Tincture, Kombé seeds	3.540
47	Infusion, 1% hispidus seeds	0.878
47	Infusion, 1%, ten months old	0.715
48	Infusion, 1% Kombé seeds	0.263
49	Infusion, 1% hispidus seeds	0.719
49	Infusion, 1%, ten months old	0.575

Specimens Nos. 34, 42, 44 were prepared from seeds that were not identified as to their variety. The rest of the specimens were prepared from known varieties of seeds. It will be noted that the specimens prepared from *hispidus* seeds contain a larger quantity of strophanthin than similar specimens prepared from *Kombé* seeds. This undoubtedly explains why the hispidus preparations are more toxic than the Kombé.

In order to determine whether or not results obtained by our chemical method would give us any indication as to the biological activity of these preparations, we have assayed them by the Hatcher and Brody cat method (8). Our principal reason for selecting this method rather than other biological methods was that it insures entrance into the circulation of the entire amount of the substance to be tested, so that we obtain an index of the total activity of the preparation. In other biological methods, such as the frog or guinea-pig methods, absorption may not always be complete, a matter of the utmost importance in comparing the toxicity of one substance with that of another. Moreover, we cannot assume that the elimination rate in the frog or guinea pig will be the same as in man. On the other hand, the reactions of the cat in all respects are strikingly similar to those in man. In the series of experiments described in this paper we have used seventy-seven cats and the number discarded as being atypical is only eleven, which is not a greater number of animals than would be thrown out in other biological methods.

From results obtained by the chemical method the biological activity in terms of cat units, as expressed by the Hatcher and Brody method (8), is calculated by dividing by 0.1 mg. In the chemical method the standard we have used is ouabain, of which 0.1 mg. $\times$ Kg. was found by Hatcher and others to be the average fatal dose for the cat. In the case of the specimens of strophanthin given in Table I, the number of mg. (calculated as) equal to a cat unit is the amount of these equiva-

lent to 0.1 mg. of ouabain. These results, together with results obtained by the Hatcher and Brody (8) method at the same time, are given in Table III. In the case of the tincture and infusion listed in Table II, the number of cc calculated as equal to a cat unit is obtained by dividing by 0.1, which gives the cat units per cc of preparation, and then dividing 1.0 by the number obtained gives fraction of a cc equal to a cat unit. These calculations with the determinations by the bio-assay are given in Table IV.

TABLE III.—COMPARATIVE ASSAYS BY CHEMICAL METHOD AND HATCHER AND BRODY METHOD OF PURE PRINCIPLES OF STROPHANTHINS.

Spec. No.	Kind of preparation.	Chemical assay. Mg.=c. u.	Biological. Assay. Mg.=c. u.	No. of Determinations.
7	Strophanthin, amorphous, Merck	0.135	0.126	3
50	Strophanthin, crystalline, Kombé, P., D. & Co.	0.100	0.096	7
52	Strophanthin, amorphous, Kombé, P., D. & Co.	0.164	0.149	3
53	*g*-Strophanthin, ouabain, Merck	0.100	0.081	3
54	Strophanthin, amorphous, U. S. P. IX, Merck	0.124	0.098	5
55	*h*-Strophanthin, Merck	0.101	0.107	4
56	Strophanthin, acid amorphous (?) from Kombé	0.149	0.136	3
57	Strophanthin, amorphous, U. S. P. IX, Merck	0.131	0.124	3
58	Strophanthin, amorphous, U. S. P. IX, P., D. & Co.	0.157	0.157	3

TABLE IV.—COMPARATIVE ASSAYS BY CHEMICAL METHOD AND HATCHER AND BRODY METHOD OF TINCTURES AND INFUSIONS OF STROPHANTHIN.

Spec. No.	Kind of preparation.	Chemical assay. Cc.=c. u.	Biological. Assay. Cc.=c. u.	No. of determinations.
34	Tincture, seeds unidentified	0.062	0.072	4
42	Tincture, seeds unidentified	0.067	0.087	3
44	Tincture, seeds unidentified	0.018	0.018	5
45	Tincture, Hispidus seeds	0.017	0.020	3
46	Tincture, Kombé seeds	0.028	0.028	4
47	Infusion, 1% Hispidus seeds	0.113	0.124	3
47	Infusion, ten months old	0.140	0.144	3
48	Infusion, 1% Kombé seeds	0.380	0.375	3
49	Infusion, 1% Hispidus seeds	0.139	0.151	3
49	Infusion, 1%, 10 months old	0.174	0.180	3

Upon examining Table III it will be noted that the agreement between the chemical assay and the biological assay is very close and in most of the specimens the difference is not more than 10%.[1] It is also important to note that the *Kombé*, *gratus* and *hispidus* strophanthins have the same toxicity by the chemical assay and the assay by the cat method also shows that they have a similar toxicity. Moreover, the figures by the two methods are in good agreement. The amorphous strophanthins are from 25 to 50 or 60% weaker than the crystalline Kombé, *g*-, or *h*-strophanthins. These amorphous strophanthin preparations were obtained at different times and marked as indicated in the table. When specimens were obtained from the same source, each of them had a different lot number. The fact that all the amorphous strophanthins vary in their activity would seem to indicate that they are not pure principles. The preparation No. 56, acid amorphous strophanthin, is about 50% less active than the crystalline Kombé strophanthin from which it was prepared. The agreement between the chemical assay and bio-

[1] Undoubtedly this difference could be reduced by using carefully selected male cats.

assay on this preparation is very good and this is important because, in the preparation of tinctures and infusions of strophanthus, it is believed by some that by the action of water some of the active principles are converted to acid amorphous strophanthin, especially so if heat is used in the procedure. Any change of the active principles to acid amorphous strophanthin in the strophanthus preparations would therefore be detected by the chemical assay just as it would be by the biological assay.

We call attention in Table IV to the remarkably close agreement between the chemical and biological assays. In only one of the ten preparations reported is the difference in results by the two methods more than 20%. In Preparation 42 the difference is about 25%. Specimen 48 gave interesting results by a slow rate of injection as compared with the usual ninety-minute method. Three cats were killed by the latter procedure. The average lethal dose was 0.375 cc × Kg. (the chemical method made the dose 0.380). With five other cats the time of injection was extended about one hour. The average of the five determinations was 0.449 cc. Another injection was prolonged to nearly nine hours. The lethal dose finally amounted to 0.500 cc × Kg. This experiment illustrates the importance of the rate of injection. In this connection, we may state that we have a strophanthin derivative which produces typical cardiac effect and which is practically eliminated from the cat within ten hours.

Deterioration in activity of strophanthus preparations can be detected by the chemical method as shown in the experiments on preparations Nos. 47 and 49, which were tested again after standing in the laboratory for ten months.

SUMMARY AND CONCLUSIONS.

A method for chemically assaying strophanthus preparations by the use of Baljet's alkaline picrate reaction is described.

The method permits of the direct determination of the amounts of strophanthin in terms of a crystalline strophanthin; either *gratus* strophanthin (ouabain) or crystalline *Kombé* strophanthin may be used as a standard. The latter is preferable.

The assays by the chemical method have been compared with those by the cat method of Hatcher and Brody and it is shown that there is a close agreement between them. Thus the chemical method gives an index of the potential cardiac activity of strophanthus preparations, just as it does in the case of digitalis.

It is demonstrated that the crystalline *Kombé* strophanthin, *gratus* strophanthin (ouabain), and *hispidus* strophanthin have the same toxicity in cats.

It is also shown that quantitatively the activity of preparations from *hispidus* and *Kombé* strophanthus seeds is due to the amount of strophanthin they contain. The *hispidus* preparations are more toxic than the *Kombé* because they yield a greater amount of strophanthin.

The authors desire to gratefully acknowledge the courtesy of Professor R. A. Hatcher of Cornell University Medical School, Professor W. M. Mansfield of Albany College of Pharmacy, and Parke, Davis & Company who furnished them with some of the specimens used in this work.

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A METHOD FOR DETERMINING STRYCHNINE IN THE PRESENCE OF ARSENIC TRIOXIDE, FERROUS CARBONATE, ALOIN AND CAPSICUM.

BY CHARLES H. ROGERS.

During March the Children's Department of the Minneapolis General Hospital reported receiving an eighteen-month-old girl with severe symptoms of advanced strychnine poisoning. About four hours had elapsed from the time the child ate the tablets, which had been prescribed for her mother, until the initial spasm was evidenced. The remarkable work of the hospital physicians saved the child's life and the patient was dismissed at the end of five days. It was determined that the child had eaten seven of the tablets, each supposed to contain one-thirtieth of a grain or two and two-tenths milligrams of alkaloidal strychnine; a total dose of approximately one-quarter of a grain of strychnine with a four-hour period for absorption. The recovery was so unusual that the remainder of the tablets were sent to the writer in order that the presence as well as the amount of strychnine in the tablets might be verified.

A review of the literature did not disclose a method for the determination of strychnine in the presence of arsenic trioxide, ferrous carbonate, aloin and capsicum. First, the several methods that were used unsuccessfully will be cursorily reviewed and, secondly, the suggested method of analysis that was finally devised and which gave very satisfactory results will be given.

Method A.—Ten tablets were powdered and treated with ten per cent. hydrochloric acid and filtered. The filtrate was heated to boiling and hydrogen sulphide passed into it for ten minutes. The solution was cooled and again treated with hydrogen sulphide for two minutes. The mixture was then filtered and the precipitate carefully washed with ten per cent. hydrochloric acid. The filtrate was made alkaline with ammonia and filtered, the precipitate being well washed with hot water. The filtrate was then extracted with chloroform and the extract filtered through cotton into a tared dish. The precipitated iron was also well washed with chloroform. The chloroform was then evaporated and the residue weighed and subsequently dissolved in $N/10$ sulphuric acid V. S., using $N/50$ KOH V. S. with cochineal indicator to titrate the excess of sulphuric acid.

This method had several very objectionable features. (1) The hydrochloric acid dissolved a colored sticky material from the vegetable drugs and this, passing through all extractions, contaminated the residue making it unsatisfactory from a gravimetric standpoint. (2) The color of the residue, supposed to be a mixture of the color from the aloin and the cholesterin esters of oleic, stearic and palmitic acids from the capsicum, also made it exceedingly difficult to titrate the alkaloid,

using cochineal as the indicator. (3) The hydrochloric acid attacked the ferrous carbonate and converted it to ferrous and ferric chlorides, which, upon the addition of ammonia water, produced a precipitate consisting of ferroso-ferric hydroxide from which it was exceedingly difficult to extract the alkaloid. The results obtained by this process were high and did not check.

Method B.—Ten tablets were powdered and refluxed over chloroform for six hours. The chloroform was then filtered and extracted with ten per cent. hydrochloric acid. The acid solution of the alkaloid and arsenic was then heated to boiling and hydrogen sulphide passed in to complete precipitation. From this point on the method was the same as A.

By extracting with chloroform, in which the arsenic and strychnine are soluble, the objectionable iron was eliminated. However, the vegetable extractives and coloring materials from the aloin and capsicum came through the extraction and made an accurate determination impossible.

From the preceding results it was very evident that not only the iron but also the vegetable extractives and coloring materials must be removed before satisfactory results could be obtained. The following method is suggested for determining the amount of strychnine in tonic tablets that contain arsenic, ferrous carbonate, aloin, capsicum and other vegetable drugs.

Method C.—Powder ten tablets and reflux over 125 mils of alcohol (95%) for six hours. (Each one of the tablets examined was supposed to contain two and two-tenths milligrams of alkaloidal strychnine.) Filter the material and wash with hot alcohol. Evaporate the filtrate, adding a little water as it approaches dryness. At this point most of the capsicine, a volatile alkaloid of capsicum, is driven off. Add sixty mils of 10% acetic acid and heat on a water-bath. To this hot liquid add 50 mils of a 10% normal lead acetate solution and allow to cool. Filter off the lead precipitate and wash with hot water. Heat the filtrate nearly to boiling and pass in hydrogen sulphide until all of the lead is precipitated. Filter through barium chloride filter paper and wash the sulphides with hot water. The filtrate should be colorless. Boil off the excess of hydrogen sulphide, concentrate to about 150 mils and cool. Add stronger ammonia water until the solution is alkaline and shake out with three 25-mil portions of chloroform. Dissolve the residue in $N/10$ sulphuric acid V. S. and titrate the excess with $N/50$ potassium hydroxide V. S. using cochineal as the indicator. Each mil of $N/10$ sulphuric acid V. S. is equivalent to 33.42 milligrams of alkaloidal strychnine.

This method was most satisfactory. By extracting with alcohol the ferrous carbonate was eliminated and from the acetic acid solution any coloring materials and vegetable extractives could be precipitated with lead acetate. By the above method the following results were obtained:

Sample.	Grams of strychnine found per tablet.	Grams of strychnine supposedly present in each tablet.
A	0.00217	0.0022
B	0.00230	0.0022
C	0.00223	0.0022
D	0.00219	0.0022

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AN ASSAY FOR ELIXIR OF IRON, QUININE AND STRYCHNINE, N. F.*

BY JOHN C. KRANTZ, JR.

It is the purpose of this paper to describe a method of assay for iron, quinine and strychnine in the elixir of iron, quinine and strychnine now official in the National Formulary. The facts that this preparation is one of the most generally used pharmaceuticals and that many samples examined by pure food and drug officials have indicated fraudulent quantities of active ingredients, make this assay one of importance to pharmacists.

THEORETICAL CONSIDERATIONS.

The estimation of the iron present in the elixir is the first problem to be considered. The iron in this preparation is present in the form of ferric chloride and ferric citrate, which are probably combined in the form of a double salt. If the elixir is evaporated to dryness and the residue ignited the organic matter present is readily oxidized, leaving a residue of ferric oxide and sodium carbonate. When this residue is dissolved in hydrochloric acid the solution contains ferric and sodium chlorides. Since ferric chloride liberates iodine from potassium iodide, the amount of iron present can be titrated with sodium thiosulphate solution in terms of liberated iodine. The quantity of iron present in a standard elixir may be seen by the following calculations:

$$350 \text{ cc} \times 1.3 \times 0.105 = 47.775 \text{ Gm. Fe in L. of Tr. fer. citro-chlor.}$$

$$\frac{125 \text{ cc} \times 47.775}{10{,}000} = 0.5971875 \text{ Gm. Fe in 100 cc of elixir.}$$

350 cc = the amount of ferric chloride solution used in L. of Tr. ferric citro-chloride.
1.3 = specific gravity of ferric chloride solution.
10.5% = the percentage of iron represented in ferric chloride solution.
125 cc = the amount of tincture of ferric citro-chloride used in a liter of the elixir.

The Pharmacopœia allows one per cent. variation in solution of ferric chloride, so the amount of iron present is obtained by substituting the percentage of iron present for 10.5% in the above formula. Thus if the sample of ferric chloride solution assays 11%, the quantity of iron in 100 cc of the elixir would be raised to 0.625625 Gm. If the percentage of iron were 10% the corresponding quantity of iron in the elixir would be 0.56875 Gm.

The next determination of the assay is that for total alkaloids. The quinine is present as hydrochloride and the strychnine as sulphate, so when the elixir is made alkaline with ammonia the liberated alkaloids are precipitated along with ferric hydroxide. The alkaloids can be obtained in a free state by several extractions with chloroform. When 100 cc of the elixir is used for analysis, the following calculations show the weight of the total alkaloids in an uncombined state:

$$\frac{324.26 \times 0.875}{396.71} = 0.71505 \text{ Gm. anhydrous quinine from 100 cc.}$$

324.21 = molecular weight of anhydrous quinine.
296.71 = molecular weight of quinine hydrochloride.
0.875 = Gm. quinine hydrochloride used in 100 cc of elixir.

$$\frac{668.4 \times 0.0175}{856.56} = 0.0136 \text{ Gm. strychnine from 100 cc.}$$

668.4 = twice molecular weight of strychnine.

* Scientific Section, A. Ph. A., Cleveland meeting, 1922.

856.56 = molecular weight of crystallized strychnine sulphate.
0.0175 Gm. = strychnine sulphate used in 100 cc of the elixir.
0.71505 Gm. quinine
0.01360 Gm. strychnine
0.72865 Gm. = weight of total alkaloids from 100 cc of elixir.

The separation of quinine from strychnine is the next problem. In this attempt the old oxalate and dichromate methods were not tried because of the generally admitted inaccuracy of the methods. The first method employed had for its purpose the precipitation of the sulphuric acid in combination with strychnine as barium sulphate and the weighing of the latter. The difficulty of this method lies in the small amount of strychnine sulphate present and the relative difference in the molecular weights of strychnine sulphate and barium sulphate. Thus, 0.035 Gm. of the alkaloid sulphate yields only 0.0095 Gm. of barium sulphate. On account of the small weight of the precipitate the writer was unable to obtain concordant results by this method.

In consideration of the solubilities of quinine hydrochloride and strychnine sulphate in chloroform an attempt was made to extract the quinine salt with chloroform and leave the strychnine sulphate in the elixir to be estimated as free alkaloids. The results of these extractions showed that the quinine hydrochloride could not be totally extracted from the elixir medium with chloroform.

The final and successful method of separation depends upon the decomposition of strychnine with concentrated hydrochloric acid and diluted nitric acid, whereas quinine under the same conditions is not affected. If both alkaloids are extracted in a free state and weighed, then treated with hydrochloric and diluted nitric acids, the strychnine loses its alkaloidal state and is not precipitated upon the addition of ammonia water, whereas the quinine is precipitated and may be conveniently extracted with ether and weighed. The difference in weight represents strychnine as free alkaloid. The purpose of making the second extraction with ether is to prevent the dissolving of any strychnine that may not have been decomposed by the above treatment.

EXPERIMENTAL.

(1) *Iron.*—Transfer 10 cc of the elixir accurately measured into a 15–20 cc platinum or silica crucible and carefully evaporate to dryness. Tilt crucible and ignite until all the carbonaceous matter has been dissipated. Dissolve the residue in 10 cc of concentrated HCl, using 2 cc for each washing and diluting the HCl well before transferring to a filter. Wash crucible and filter until a drop of the washings does not react with potassium ferrocyanide, then add 2 Gm. of potassium iodide to the ferric chloride solution. Transfer to a tightly stoppered flask and heat to 40° C. for 30 minutes.

Add 100 cc of water and titrate the liberated iodine with $N/10$ $Na_2S_2O_3$ V. S., starch paste indicator. Each cc of $N/10$ $Na_2S_2O_3$ V. S. used corresponds to 0.005584 Gm. Fe.

Grams Fe present in 100 cc of elixir	0.5971
Determination I showed.....	0.5913 Gm.
Determination II showed.....	0.5930 Gm.

(2) *Total Alkaloids.*—Evaporate 100 cc of the elixir accurately measured to 75 cc on a water-bath. Transfer to a separator, rinse container with enough

distilled water to make the volume of the elixir about 100 cc. Make the elixir decidedly alkaline to litmus with ammonia water; extract the alkaloids with four portions of chloroform (20, 15, 10, 10) and evaporate the combined chloroform extractions to dryness on a water-bath. Dry the residue to a constant weight at 125° C. and weigh the strychnine sulphate and quinine hydrochloride from 100 cc of the elixir as free alkaloids.

Grams calculated to be present.....	0.72865
Determination I showed.....	0.7290 Gm.
Determination II showed.....	0.7289 Gm.
Determination III showed.....	0.7295 Gm.

(3) *Separation of Quinine from Strychnine.*—Dissolve residue in 5 cc to 7 cc of concentrated HCl with the aid of gentle heat. Add 3 cc of dilute nitric acid (1 cc concentrated HNO_3 and 19 cc water); heat until the solution becomes dark orange to red. Dilute with 75 cc water, transfer to a separator and slowly make the mixture alkaline to litmus with dilute ammonia water. Extract the precipitated quinine with four portions of ether (20, 15, 10, 10) and evaporate the combined ether extractions to dryness on a water-bath. If any of the quinine should remain clinging to the sides of the separator in an apparently insoluble form, it may be dissolved in a little dilute acid, precipitated with ammonia and extracted with ether; the ether extraction is added to the other ethereal extractions. Dry the residue to a constant weight at 125° C. and weigh as anhydrous quinine The difference between the above weighing and this weighing is equivalent to the amount of alkaloidal strychnine present.

The following factors convert the weights of the anhydrous alkaloids into terms of the crystallized sulphate and hydrochloride, respectively.

$$\text{Quinine } \frac{396.71}{324.26} = 1.223 \text{ factor}$$

$$\text{Strychnine } \frac{856.56}{668.4} = 1.28 \text{ factor}$$

The following results were obtained:

Quinine hydrochloride in 100 cc

Determination I showed.....	0.8720 Gm.
Determination II showed.....	0.8771 Gm.
Determination III showed.....	0.8762 Gm.
Determination IV showed.....	0.8757 Gm.

Strychnine sulphate in 100 cc

Determination I showed.....	0.0193 Gm.
Determination II showed.....	0.0170 Gm.
Determination III showed.....	0.0170 Gm.
Determination IV showed.....	0.0175 Gm.

The experiments carried out in this laboratory indicate that the above method of assay for elixir of iron, quinine and strychnine is practicable, simple in procedure and yields results sufficiently accurate for a determination of this type.

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THE COMPARATIVE GERMICIDAL EFFICIENCY OF PHENOL, MERCURIC CHLORIDE AND POTASSIUM MERCURIC IODIDE.*

BY JOSEPH G. CADORA.

The value of any substance as a disinfectant, particularly of one to be employed under conditions where its behavior toward the tissues of the human body must be considered, depends upon the correlation of four principal factors, namely, the power to kill promptly and surely all forms of bacterial life; relative freedom from poisonous properties in dilutions germicidally efficient; the absence of any marked precipitating action on proteins; and the cost.

The application of biologic methods to the testing of disinfectants has made it possible to determine accurately not only the killing power of any substance upon bacteria but also to measure its toxicity and its precipitating action and, therefore, from this data to calculate its actual final efficiency as a germicide.

In these various determinations phenol is taken as the standard of comparison, and all values found are expressed as relative coefficients of the phenol values. For measuring the germicidal action of any substance under controlled conditions the method of determining the phenol coefficient as advocated by the United States Hygienic Laboratory[1] is applicable and in the hands of experienced workers yields reliable information. The actual, or relative, toxicity may be ascertained by the method described by Hale,[2] while the precipitating or coagulating action on proteins may be measured by any of several methods.

The present study was undertaken with the purpose of obtaining definite information concerning the germicidal value of potassium mercuric iodide, especially as compared with the more commonly used mercuric chloride and phenol. This double salt of mercury and iodine has long been used in the treatment of various affections of infectious origin, but not until comparatively recent years has it been employed to any wide extent as a general disinfectant. The work of Macfarlan,[3] Watson,[4] McKenna and Fisher,[5] and others would seem to show that potassium mercuric iodide possesses to a marked degree the essential properties of a highly efficient germicide, and that, on account of these properties, it is singularly well suited to a variety of applications in medical and surgical practice.

On account of the promise held out by the work of these authors it seemed that it would be of value to make a quantitative study of the relative germicidal power, coagulating action and toxicity of this mercury salt as compared with similar properties of the somewhat related mercuric chloride, with phenol as the standard of comparison.

EXPERIMENTAL.

1. Preparation and Assay of Solutions.—A. Chemicals: The phenol and mercuric chloride were of reagent grade, as were also the potassium iodide and mercuric iodide employed in the preparation of the potassium mercuric iodide. These chemicals were tested by the usual chemical assays for determining chemical purity, and were found to be of the desired standard.

B. The Solutions: Phenol, 5 Per cent. A five per cent. phenol solution was prepared by making a slightly overstrength solution, titrating by the U. S. P. IX

* An investigation made at the Massachusetts College of Pharmacy, under the direction of Benjamin White, Ph.D., Associate Professor of Biologic Assaying and Immunology.

method, adjusting to the desired point and retitrating. The assay of the final standard solution as used showed it to contain 5.002 per cent. phenol.

Mercuric Chloride, 1 Per cent. The same procedure was followed in preparing this solution and its final assay showed it to contain 1.001 per cent. mercuric chloride.

Potassium Mercuric Iodide, 1 Per cent. This solution was prepared by dissolving 5.77 grams red mercuric iodide in 1000 cc water containing 8.65 grams potassium iodide. The assay was performed according to the U. S. P. IX method for the determination of mercury and mercuric iodide in Donovans' solution, and showed it to contain 0.979 per cent. potassium mercuric iodide.

All solutions were made from distilled water redistilled from glass and were stored in the dark in Pyrex flasks with air-tight stoppers.

2. *Phenol Coefficient.*—The phenol coefficient of the two mercury salts was not personally determined by the author, because the figures from a recent test on similarly assayed solutions competently performed by one experienced in this determination were available.* The protocol follows:

PHENOL COEFFICIENT WITHOUT ORGANIC MATTER.

1. *Phenol:* Time	2½	5	7½	10	12½	15 (minutes)
1–80	...	...	...	...	...	...
1–90	x	x	...	...	...	...
1–100	x	x	x	x	...	...
2. *Potassium Mercuric Iodide:*						
1–40,000 = 80,000	...	...	...	...	...	...
1–42,000 = 84,000	x	...	...	...	...	...
1–44,000 = 88,000	x	...	...	...	...	...
1–46,000 = 92,000	x	x	...	...	...	...
1–48,000 = 96,000	x	x	x	...	...	...
1–50,000 = 100,000	x	x	x	...	...	...
1–52,000 = 104,000	x	x	x	...	...	...
1–54,000 = 108,000	x	x	x	x	...	...
1–56,000 = 112,000	x	x	x	x	...	...
1–58,000 = 116,000	x	x	x	x	...	...
1–60,000 = 120,000	x	x	x	x	x	...
3. *Mercuric Chloride:*						
1–35,000	...	...	...	...	...	...
1–38,000	x	...	...	...	...	...
1–40,000	x	x	...	...	...	...
1–46,000	x	x	x	...	...	...
1–50,000	x	x	x	x	...	...
1–54,000	x	x	x	x	x	x

Potassium Mercuric Iodide $\frac{80{,}000}{80}\ \frac{120{,}000}{100} = \frac{1000+1200}{2} = \frac{2200}{2} = 1100$

Mercuric Chloride $\frac{35{,}000}{80}\ \frac{50{,}000}{100} = \frac{435.5+500}{2} = 468.7$

Taking the germicidal power of phenol as one, the coefficient for mercuric chloride, according to this determination, was 468.7, and for potassium mercuric iodide it was 1100, or more than twice that of the bichloride.

* The protocol was kindly placed at the writer's disposal by Dr. R. W. Lamson of the Harvard Medical School.

3. Toxicity Coefficient.—The method used was that of Hale.[2] White mice, weighing between 15 and 20 grams, were used, animals of varying weights being equally allocated in the three series. The solutions were so diluted (using precision pipettes and calibrated burettes) that the total dose never exceeds 0.8 cc per mouse. All doses were calculated in grams per gram of body-weight. The injections were made subcutaneously on the dorsal surface at the root of the tail, and hypodermic needles of 27 gauge were used to lessen the liability to leakage and to avoid trauma. The animals were kept under the most sanitary conditions in glass jars and observed for a maximum period of fourteen days. The results are shown in the following table:

Phenol.		Mercuric Chloride.		Potassium Mercuric Iodide.	
Dose—Grams per Gm. body wt.	Result.	Dose—Grams per Gm. body wt.	Result.	Dose—Grams per Gm. body wt.	Result.
0.00028	S	0.00001	S	0.00002	S
0.00028	S	0.000011	S	0.00002	S
0.00029	S	0.000011	S	0.000022	S
0.0003	S	0.000011	S	0.000022	D—10 days
0.0003	S	0.000011	D— 4 days	0.000023	S
0.00031	S	0.000011	D— 4 days	0.000023	D— 4 days
0.00032	S	0.000011	D— 4 days	0.000024	D—10 days
0.00035	D— 1 hr.	0.000012	S	0.000024	S
0.00035	D— 1 hr. 40 min.	0.000012	S	0.000025	S
0.00035	D—14 hrs.*	0.000012	D— 3 days	0.000025	S
0.00036	D— 1 hr.	0.000012	D— 3 days	0.000025	S
0.00036	D— 1 hr.	0.000012	D—10 days	0.000026	D— 4 days
0.00037	D— 1 hr.	0.000012	D—10 days	0.000026	D— 4 days
0.00037	D—14 hrs.*	0.000013	D— 2 days	0.000026	D—11 days
0.00038	D— 1 hr. 17 min.	0.000013	D— 4 days	0.000027	D— 4 days
0.00038	D— 1 hr. 17 min.	0.000013	D— 4 days	0.000027	D— 4 days
0.0004	D—14 hrs.	0.000013	D—10 days	0.000028	D— 8 days
		0.000014	D— 2 days	0.000029	D— 3 days
		0.000014	D— 4 days	0.00003	D— 8 days
		0 000014	D— 4 days		
M. L. D.		M. L. D.		M. L. D.	
0.00035 Gm. per Gm. mouse		0.000012 Gm. per Gm. mouse		0.000026 Gm. per Gm. mouse	

D = Died.
S = Survived.

Therefore taking the toxicity of phenol as one, the coefficient of mercuric chloride is 29.2 and that of potassium mercuric iodide is 13.4, or slightly less than one-half that of mercuric chloride.

4. Coagulation Coefficient.—The method described by Schneider[6] was used for the first determination. This method consists in taking as a standard the degree of turbidity produced by adding 5 cc of the 5 per cent. phenol solution to 5 cc of specially prepared and assayed 1 per cent. egg albumin solution. An equal volume of varying dilutions of the mercuric chloride solution was then added to 5 cc of the standard albumin solution until a dilution was found which gave the same degree of turbidity as that produced under identical conditions by the phenol solution. This dilution was 1:1100. Therefore it is evident that if 5 cc of a 1:1100

* Between 2 and 14 hours—No observations made in interval.

solution of mercuric chloride will produce a degree of albumin coagulation equal to that produced by 5 cc of a 5 per cent. solution of phenol, the proportionate coagulating effect is as 1100 is to 20, or 55.

With the 1 per cent. potassium mercuric iodide solution no turbidity was produced when it was added to the egg albumin solution, and, furthermore, no turbidity could be produced with larger volumes of more concentrated solutions of the double mercury salt.

The results obtained by this method were checked by tests in which horse serum was substituted for the egg albumin. This modification was made because it seemed that inasmuch as it is the coagulating or precipitating effect of a germicide on serum proteins that is of importance, a fairer measure of this action could be obtained by using the horse serum instead of egg albumin. Analysis showed that the horse serum used contained approximately 8 per cent. serum protein. The horse serum was employed undiluted, and for the standard, one cc of the 5 per cent. phenol was added and the mixture made up to 10 cc with water. It required 5 cc of a 1:65 dilution of the 1 per cent. mercuric chloride solution to produce the standard degree of turbidity, which gives a coagulation coefficient for mercuric chloride by this method of 65.

The one per cent. potassium mercuric iodide solution failed to produce any turbidity in the horse serum, and it was astonishing to find on repeated trials that this double iodide as the pure salt was entirely soluble in horse serum in the proportion of one gram of salt per cubic centimeter of serum, and that with this concentration no visible coagulation of the serum proteins took place. This character of potassium mercuric iodide, namely, that of forming no insoluble combination with proteins, has been previously mentioned in the literature, but so far as the author is aware, no reports of quantitative or comparative determinations of this character have been published.

5. *Comparative Costs.*—At the time this work was completed the costs for the three germicides used (in C. P. grades) were as follows:

Phenol	$1.65 per kilo	= 1
Mercuric Chloride	4.44 per kilo	= 2.69
Potassium Mercuric Iodide*	18.07 per kilo	= 10.95

7. *Efficiency Value.*—Substituting the figures obtained in this investigation for the factors in the formula:

$$\text{Efficiency Value} = \frac{\text{Phenol Coefficient}}{\text{Toxicity Coefficient} + \text{Coag. Coef.} + \text{Cost}}$$

we obtain for

1. Phenol $\frac{1}{1+1+1} = \frac{1}{3}$ corrected (x 3) = 1 or standard.
2. Mercuric Chloride $\frac{468.7}{29+65+2.69} = 5$, corrected (x 3) = 15.
3. Potassium Mercuric Iodide $\frac{1100}{13.4+95+10.0} = 45$, corrected (x 3) = 135.

* Based on the cost of mercuric iodide and potassium iodide in the proportions used.

While it is obviously impossible to reduce such values to a strict mathematical equation, this formula seems to afford a comparative estimate of the efficiency value of these three germicides.

SUMMARY.

In this study of the comparative germicidal values of phenol, mercuric chloride and potassium mercuric iodide, comprising determinations of the phenol coefficient, the toxicity coefficient, coagulation coefficient and the cost, it was found that potassium mercuric iodide, because of its remarkably high germicidal coefficient, its relatively low toxicity as compared to mercuric chloride, and its freedom from any coagulating or precipitating action on proteins, is far more efficient as a germicide than either phenol or mercuric chloride, and, notwithstanding its greater cost, its efficiency value is fifteen times that of mercuric chloride and is approximately one hundred and fifty times that of phenol.

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THE PREPARATION OF ACID-FAST CARAMELS.*

BY GEORGE D. BEAL AND DONALD F. BOWEY.

This paper deals with the preparation of a caramel which will fully comply with the specifications used by up-to-date bottlers and others using the color and which will be sufficiently economical in preparation to compete with those already on the market. In 1913 it was pointed out by Brant that a desirable compound to be used in the coloring of beers should not suffer any change in tint when treated with a 0.5% solution of tartaric acid. Some varieties of caramel will retain their color indefinitely when used in the coloring of mildly acid beverages; others while withstanding the action of the acid will become discolored if the beverage is carbonated. Recently the demand for caramel to be used in the coloring of soft drinks has grown enormously.

An eastern manufacturer has succeeded by a secret process in preparing caramel which has been advertised as being acid-fast, and has been so successful in capitalizing this property that the majority of caramel users in the country demand an acid-fast caramel.

The specifications commonly adopted are as follows: Sixty grains of the concentrated caramel are dissolved in eight ounces of hot water. If one-half of this

* Contribution from the Chemical Laboratory of the University of Illinois. Read at the meeting of the American Pharmaceutical Association in Cleveland, Ohio.

solution on boiling with one drachm of commercial hydrochloric acid will remain clear for thirty minutes with no visible loss in tinctorial strength the caramel may be considered to be acid-fast. Ordinary sugar colors will make a very satisfactory coloring agent for soft drinks, bakers' supplies and candies, but the acid-fast color has become the standard of the industry.

The majority of commercial caramels are prepared from glucose, primarily because of the cheapness of the starting substance, although sucrose caramels apparently have a greater intensity. The method of manufacture usually consists in heating the glucose in a large iron kettle over a coal fire. Under these conditions the control of temperature, etc., becomes rather difficult. In our experiments all of the heats were made in a one-liter pyrex flask, heated in an oil-bath. Commercial glucose containing 85% of the sugar was used.

The general procedure followed was as follows: One hundred grams of glucose were melted in twenty-five cc of water. The empty pyrex flask was lowered into the oil-bath and the bath brought to the desired temperature. While maintaining this temperature, the melted glucose was poured into the flask, noting the time when added. At the end of the predetermined period of heating the flask was removed from the bath and five hundred cc of water added to the flask and allowed to stand for one hour to dissolve the color. The solution was filtered through asbestos in a Gooch crucible in order to determine the amount of insoluble char. The char adhering to the flask could be removed with ten per cent. sodium carbonate solution.

The caramels which were prepared by the above method were tested for acid-fastness, tinctorial strength and presence of char. The acid test was as modified by ourselves. Twenty-five cc of the filtered caramel solution were diluted with fifty cc of water and five cc of 6-normal hydrochloric acid. This solution was boiled in a small beaker. Ordinary caramels broke down in ten to fifteen minutes' time, but the acid-fast caramels remained clear even on prolonged boiling.

The caramel was tested for tinctorial strength by diluting five cc of the filtered caramel to one-hundred cc which solution was then compared in a colorimeter with one which had been arbitrarily prepared. The values obtained were for purposes of comparison only, and were not regarded as an actual measure of the absolute color value of the solution.

The first series of heats was made to determine the effect of time and temperature upon the three factors by which the product was judged. No catalytic agents were used.

It was apparent from the above that an acid-fast caramel could not be prepared by dry distillation of the sugar alone. The resulting caramel broke down on boiling with the acid and had a tinctorial value far below that which should have been obtained with the period of heating. The caramels which were formed with the highest percentages of char had the highest tinctorial values and were most resistant to acid.

Some authors have stated that the color strength would be improved if the sugar were caramelized in the presence of a little alkali. Four heats were run with the addition of ten cc of ten per cent. sodium carbonate solution at the beginning of the heating, other conditions being unchanged.

TABLE I.

EFFECT OF TIME AND TEMPERATURE UPON CARAMELIZATION.

Time, min.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
25	210°	2.68	22	8
30	210°	3.01	26	10
35	210°	3.24	35	10
40	210°	3.39	34	10
45	210°	3.53	33	10
50	210°	3.81	39	10
55	210°	4.00	26	17
60	210°	6.45	33	15
65	210°	5.18	36	15
70	210°	7.84	40	18
25	220°	3.00	25	12
30	220°	6.67	36	15
35	220°	5.59	28	15
40	220°	3.07	28	13
45	220°	4.78	31	16
50	220°	7.43	35	16
55	220°	6.61	33	15
60	220°	4.60	35	15
65	220°	7.18	38	16
70	220°	8.20	42	17
25	230°	3.15	26	13
30	230°	3.36	33	13
35	230°	5.19	36	15
40	230°	4.95	31	15
45	230°	6.31	36	15
50	230°	7.55	38	16
55	230°	7.85	41	18
60	230°	6.19	38	17
65	230°	5.50	36	15
70	230°	8.55	43	18

TABLE II.

CARAMELIZATION IN PRESENCE OF 10 Cc of 10% SODIUM CARBONATE.

Time, min.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
30	210°	3.58	31	10
40	210°	4.63	35	12
50	210°	6.95	45	15
60	210°	8.30	48	15

Only the tinctorial strength of the caramel was improved in this way, there being little or no effect upon the acid-fastness.

TABLE III.

CARAMELIZATION IN PRESENCE OF DILUTE HYDROCHLORIC ACID.

Time, min.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
30	210°	2.68	28	12
40	210°	2.98	29	12
50	210°	5.46	35	12
60	210°	5.65	43	15

A claim has been made that an excellent caramel could be prepared if a small amount of acid was added at the beginning of the operation. In the next four

heats five cc of hydrochloric acid solution, one part of 6-normal acid to sixteen parts of water, were added at the beginning of the heating.

The use of hydrochloric acid reduced the percentage of char but had no effect upon the tinctorial strength or acid-fastness. Similar experiments with sulphuric, nitric and phosphoric acids showed no improvement in the quality of caramel formed.

In cooking the test batches the caramel when just at the cracking stage rose rapidly to the neck of the flask. No stirring device to keep down the frothing was satisfactory. With the idea of securing a stirring effect which would progress with the degree of heating the addition of volatile salts was tried. Herzfeld (*Deut. Zuckerind*, 35, 617) has prepared caramel by heating an 80% invert sugar syrup in an oil-bath at 170–180°. He finds that the time required is materially reduced by the addition of ammonia from time to time, although he is uncertain as to the action of the ammonia. A series of heats was made with the addition of five cc of a ten per cent. solution of ammonium chloride to the glucose.

TABLE IV.

CARAMELIZATION WITH AMMONIUM CHLORIDE SOLUTION.

Time, min.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
15	200°	8.63	121	30
16	200°	8.95	126	30
17	200°	9.54	127	30
18	200°	11.65	135	30
19	200°	12.48	132	30
20	200°	15.63	133	30

Only one-third of the time previously taken was required for the caramelization, the sugar did not froth, the caramel had a very much higher tinctorial value and was acid-fast. Apparently the best caramel was obtained in eighteen minutes' heating. Working at 200° and holding the heat for eighteen minutes, the quantity of ammonium chloride was varied in the next series of heats.

TABLE V.

EFFECT OF VARIATIONS IN THE AMOUNT OF AMMONIUM CHLORIDE ON CARAMELIZATION, TIME AND TEMPERATURE CONSTANT.

10% NH_4Cl, Cc.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
10	200°	25.63	142	30
9	200°	24.03	140	30
8	200°	19.25	141	30
7	200°	16.48	138	30
6	200°	13.78	135	30
5	200°	12.89	138	30
4	200°	9.05	121	25
3	200°	3.35	96	15

The best results were obtained with five cc of ammonium chloride solution. By using this quantity of ammonium chloride in combination with dilute solutions of hydrochloric and phosphoric acids the only effect obtained was a slight but not significant increase in the tinctorial strength of the caramel.

The chief objection to the use of the ammonium chloride being the cost of the salt, similar experiments were attempted with the substitution of a ten per cent. solution of commercial ammonium sulphate.

TABLE VI.

CARAMELIZATION WITH FIVE CC OF TEN PER CENT. AMMONIUM SULPHATE SOLUTION.

Time, min.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
15	200°	6.23	125	25
16	200°	7.86	128	25
17	200°	6.43	131	30
18	200°	6.64	142	30
19	200°	10.83	144	30
20	200°	15.65	149	30

Again the best results seemed to be obtained with eighteen minutes' heating. Accordingly the quantity of ammonium sulphate solution was varied in the next series of heats, keeping the temperature and time at 200° and eighteen minutes, respectively.

TABLE VII.

EFFECT OF VARIATIONS IN THE AMOUNT OF AMMONIUM SULPHATE SOLUTION; TEMPERATURE AND TIME CONSTANT.

10% $(NH_4)_2SO_4$, cc.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
10	200°	21.61	153	30
9	200°	23.45	151	30
8	200°	19.82	146	30
7	200°	21.07	143	30
6	200°	15.92	139	30
5	200°	12.48	140	30
4	200°	8.52	136	30
3	200°	4.81	116	20

The caramel obtained by the use of ten cc of ammonium sulphate solution had the highest tinctorial value, but the per cent. of char was high. The experiment was repeated, adding three cc of the hydrochloric acid solution previously mentioned with the ammonium salt.

TABLE VIII.

EFFECT OF VARIATIONS IN THE AMOUNT OF AMMONIUM SULPHATE WITH THREE CC OF HYDROCHLORIC ACID ON CARAMELIZATION, TIME AND TEMPERATURE CONSTANT.

10% $(NH_4)_2SO_4$, cc.	Temperature, Centigrade.	% of char.	Tinctorial No.	Acid test, min.
10	200°	16.05	162	30
9	200°	17.95	161	30
8	200°	15.31	158	30
7	200°	10.65	145	30
6	200°	12.77	151	30
5	200°	10.00	149	30
4	200°	8.78	145	30
3	200°	6.23	130	25

The presence of the acid reduces the quantity of salt required to about one-half the previous amount. The quality of the product remains unchanged. An attempt was made to substitute sulphuric and phosphoric acids for the hydrochloric acid, but a very poor product was obtained.

The following method is suggested for the preparation of an acid-fast caramel of high tinctorial strength. Place in a beaker or casserole one hundred grams of crystallized glucose and twenty-five cc of water. Heat the mixture upon a water-

or steam-bath until the sugar is liquefied. Add to this heavy syrup five cc of ten per cent. ammonium sulphate solution and three cc of a dilute hydrochloric acid made by mixing one volume of 6-normal acid with sixteen volumes of water. Place a one-liter pyrex or Jena flask in an oil-bath and heat to 200°. While retaining this temperature add the glucose syrup and heat for eighteen minutes. Remove the flasks from the bath and add, as soon as sufficiently cool, sufficient water to dissolve the caramel. Allow to stand until solution is complete and remove the char by filtration.

SUMMARY.

1. A satisfactory caramel can be prepared by heating commercial crystallized glucose in the presence of small amounts of ammonium sulphate and hydrochloric acid.

2. The ammonium sulphate and acid do not seem to enter into the composition of the caramel, but apparently act by facilitating the dehydration of the sugar molecule.

3. Dialysis of the caramel so prepared through a collodion membrane against water shows the absence of unchanged sugar.

4. The authors would suggest that the acid-fastness of a caramel depends upon the complete conversion of the sugar, the decolorization on heating with acid being initiated by the action of the acid upon the unchanged sugar.

URBANA, ILLINOIS,
AUGUST 1922.

PHYTOCHEMICAL NOTES.*

No. 92. Constants of Cassia Leaf and Twig Oils.[1]

BY I. NISHMURA.

The oils, the distillation of which is reported in the previous note,[2] were not examined at once owing to unavoidable delay. Their constants were determined a year later and are herewith reported. As an indication of the changes that took place during this interval, the densities of the leaf oils as originally determined and as redetermined a year later are here recorded side by side.

	Fall 1920 $d_{22°}$.	Fall 1921 $d_{20°}$.
1 Oil bale No. 1, original and cohobated	....	1.049
2 Original oil bale No. 5	1.0525	1.045
3 Original oil bale No. 2	1.0523	1.059
4 Cohobated oil (first) bale No. 1	1.0547	...
	1.0530	...
5 Cohobated oil (first) bale No. 5	1.0540	1.035
6 Cohobated oil (first) bale No. 2	1.0535	1.037
7 Cohobated oil (second) bales Nos. 1, 5 and 2	....	1.032

The differences are not great, but, what seems surprising, is that the densities taken about a year after distillation, are, for the most part, slightly lower than those first taken. Inasmuch as this is almost uniformly the case, this difference cannot

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* From the laboratory of Edward Kremers.

[1] Scientific Section, A. Ph. A., Cleveland meeting, 1922.

[2] April JOURNAL A. PH. A., p. 294.

well be attributed to experimental errors. The only way to account for this difference at present is to assume that the Mohr-Westphal balances used by the two operators are to be held responsible.

So far as practicable the physical and chemical constants of these oils were determined. The results are herewith tabulated.

	$d_{20°}$.	$n_{D25°}$.	$\alpha_{D20°}$.	Aldehyde content, p. c.	Acid value.
1	1.049	1.603	± 0°	85	15.7
2	1.045	1.5995	−16.2°	84	51.7
3	1.059	1.6020	− 1.2°	86	21.4
4	1.062	1.603	− 3.0°	91	49.7
5	1.035	1.606	± 0°	90	13.0
6	1.037	1.606	± 0°	84	8.9
7	1.032	1.606	+ 4.2°	90	11.9

At the time of examination the original oils were still clear yellow in color, the cohobated oils were cloudy and two of them (Nos. 5 and 7) were brown in color. Those that revealed optical activity were observed in a 1:2 alcoholic (by vol.) solution either to overcome the brown color or the turbidity of the oil.

For the rest the constants are somewhat puzzling. The larger aldehyde content of three of the cohobated oils is readily understood, but that of the fourth cohobated oil is as low as that of any of the original oils. The higher acid content of two of the oils, one an original oil, the other a cohobated oil, might be attributed to the containers in which these oils were kept. However, the densities of these two oils are slightly lower than those of the other oils in each group. With one exception (?) the optical rotations are uniformly low as might be expected, but, again, within the narrow ranges, no generalization can be drawn from these physical constants of the two groups when contrasted with each other. Possibly the amount of original oil mechanically suspended in the aqueous distillate and thus carried over into the cohobated oil has something to do with these seeming irregularities.

The twig oils were examined in like manner. The two sets of specific gravity determinations are first recorded for the sake of comparison.

	$d_{22°}$, 1920.	$d_{20°}$, 1921.
Original oil, charge No. 1.....	1.0477	1.012
Original oil, charge No. 2.....	1.0477	1.013
Original oil, charge No. 3.....	1.0465	...
Oil from cohobations.....	1.0473	...

With one exception these densities are appreciably lower than those recorded by Chen.

The remaining physical constants, together with the densities determined at the same time, are herewith tabulated.

	$d_{20°}$.	$n_{D25°}$.	$\alpha_{D20°}$.	Aldehyde content, p. c.	Acid value.
Original oil, charge No. 1.....	1.012	1.603	−15.0°	86	6.5
Original oil, charge No. 2.....	1.013	1.604	−15.0°	84	6.8
Original oil, charge.....	1.017	1.603	−15.0°	82	16.9
Cohobated oil, charge No. 1.....	1.026	1.608	−15.0°	90	16.0
Cohobated oil, charge No. 2.....	1.021	1.608	− 7.8°	92	13.2
Cohobated oil, charge.....	1.023	1.609	− 7.8°	92	14.5
Cohobated oil	1.040	1.606	− 7.8°	96	81.4

With one exception the oils as grouped suggest a close similarity in each group as might be expected. Thus the density of the cohobated oils is, as a group, slightly higher than that of the original oils, the last oil to be separated after cohobation having the highest density. The index of refraction of the cohobated oils is, likewise, somewhat higher than that of the original oils. With one exception the optical rotation of the cohobated oils is about one-half of that of the original oils, whereas the aldehyde content is slightly higher. Both differences are such as one might expect from the chemical constituents of the oil and their relative solubility in water. Again it may be assumed that the high angle of rotation of the first cohobated oil recorded in the table is due to original oil carried mechanically into the cohobated oil by the aqueous distillate in which the oil was suspended and from which it had not been carefully separated. The acid values show no such regularities. These differences may readily be accounted for by the differences in the containers in which the oils were kept during the long interval between distillation and examination.

As already stated, these results may be of interest since they supplement the earlier investigation of Schimmel & Company. Although their chemists examined other parts of the shrub as well, they did not examine separately the oils from the leaves and twigs. As a biochemical study their investigation is much more complete. Yet, from a practical point of view it seemed desirable to examine the leaves and twigs separately since these are the two principal elements that enter into the distillation of the commercial oil. As Schimmel & Co. themselves point out, the other parts examined by them play but a minor, if not a negative, rôle in the distillation of the commercial oil.

PHARMACOGNOSY IN THE GARDEN.*

BY E. E. STANFORD.

A botanical garden devoted mainly to medicinal and poisonous plants was established at Western Reserve University in the spring of 1921. This beginning, for reasons which will be noted later, was far from being a pretentious one, but it was a beginning, at least, with several distinct ends in view, some obvious and some less so. Without attempting to present these objects or their stages of fulfilment in any very logical order—leaving some of them, indeed, quite out of the immediate question, these random remarks on our successes and failures to date are offered with the idea that they may be of some interest and encouragement to those of our colleagues who, in somewhat similar situation, may be contemplating a similar experiment. From those of longer pharmacultural experience, who plant in acres as we in footage, we crave an indulgent smile and perhaps a word of helpful criticism.

Lack of interest in courses in pharmaceutical botany and pharmacognosy may not infrequently be traced to the static nature of the work. Under the microscope, except in an occasional elementary microchemical test, nothing happens. Cells, tissues, organs, preserved in balsam or cleared in chloral hydrate, are fragments only, they do not function. In pharmacy or chemistry a nodding head may get blown off, but even that wakening stimulus is absent here. As digitalis or belladonna develops under his hand from seed to sprout, from sprout to maturity, from ma-

* Scientific Section, A. Ph. A., Cleveland meeting, 1922.

turity to the finished drug, vital processes unfold before the student. The plant is a living thing—not a corpse in a can. Life calls to life.

Cleveland School of Pharmacy, located in a crowded down-town area since its inception, was destitute of garden space. Commerce and industry claimed every inch—save a near-by scanty acreage—a garden of a sort—a thickly crowded one, in the planting of which pharmacy would not boast the part it may have had.

Cleveland School of Pharmacy, attached for some years to Western Reserve University by a tenuous thread of "affiliation," became an integral part of the larger institution in 1919. In the summer of 1921 the down-town quarters were sold, and the school moved to the University Campus. There it occupies a building remodeled to furnish it temporary offices and some laboratory space, while the remainder of its work is carried on in various other buildings of the university.

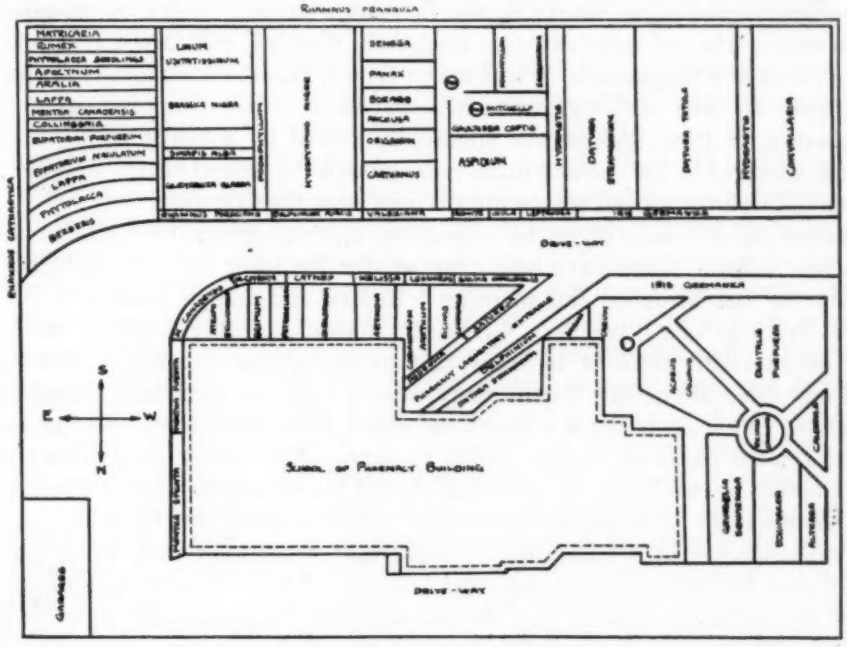

Fig. 1.—Western Reserve Botanical Garden.

Vacant inches on the present lot of the Pharmacy Building—back yard, front yard, and the verticality of the fences—totalled an area of about one-fifth of an acre. The soil was a hard, dry sandy clay, plentifully mixed with subsoil from building operations. It contained little humus, and the small amount of natural moisture was further depleted by a number of trees—silver and Norway maples, and elms—not much less efficient, for desiccating purposes, than vacuum pumps. While hardly the most promising locale in the world, it was available, and it was infinitely better than nothing.

The beginning was made in the spring of 1921. Practically all work except manure spreading and preliminary plowing and fencing has been done by students, as part of laboratory courses in botany and pharmacognosy.

Choice of plants had to be governed by soil and shade conditions, and has been, thus far, mainly experimental. We have thought it best to utilize a considerable

number of species in small plots rather than a few in larger ones. In all about 100 species have been grown.

Success in all cases was neither anticipated nor realized, but in general the results have been beyond expectation. The accompanying plan (Fig. 1) shows the distribution of the principal plantations only for the current season (1922).

The immediate shade of the maples and elms has proved the most refractory ground. In spring Convallaria furnishes pleasant green and white covering for such soil. The rhizomes, which spread so rapidly through a more favorable soil, make but slow headway in the summer-hardened clay. The Composites make a good growth at first, but later become somewhat spindling, and flower heads do not develop well. Digitalis does well, when once established, but shows reluctance to flower. It is very difficult to germinate this seed even in hotbeds in our soil. Stramonium is good in sun, markedly less vigorous in shade. Even copious watering fails to mellow the soil sufficiently for Hydrastis, Ginseng, Pink Root, and Senega. Podophyllum and Sanguinaria do well in our type of shade, but naturally are plants which make all their visible growth early, and more or less disappear later. Our first planting of these species was apparently ruined by a heavy wind, but the rhizomes survived in the soil and made good growth the second year. Aconite and valerian did well the second season after a poor start the first year.

Indigenous perennial plants have been dug and transplanted by students from woods and fields. These have been planted, for the most part, in full sunlight. Best success has attended fall planting. Rumex and Lappa luxuriated in the unusual privilege of cultivation. *Verbascum thapsus*, another common weed, we found unexpectedly difficult to transplant in the spring; the leaves sometimes wilted and dried altogether, but in many cases a vigorous secondary growth took their place. Phytolacca made a handsome, rapid, hedge-like growth; though many roots, for some unknown reason, failed to survive the winter their places were taken quickly by seedlings. A plentiful second season appearance of Phytolacca seedlings in vacant spots and under shrubbery was no doubt due to birds.

Three species of Eupatorium—*perfoliatum*, *maculatum* and *purpureum*—showed need for wide spacing under cultivation. *Aralia racemosa* adapted itself readily to garden conditions, but several attempts to transplant *A. nudicaulis* failed, possibly because the spreading, sparsely rooted rhizomes were moved during the growing season instead of in the autumn. *Apocynum cannabinum* made a fair growth.

Many of the Labiatae, especially those normally grown from rhizome-cuttings, have succeeded well. Their stony nutlets, however, germinated with considerable difficulty. Catnep quite failed to appear in the season of its sowing, but came up luxuriously twelve months later when the space had been assigned to something else. This species transplants poorly. Hedeoma, Lavandula and Thymus also failed almost wholly to germinate. Possibly hot water or acid treatment of these resistant seeds might stimulate them to action. *Satureja hortensis* and *Ocimum basilicum*, on the contrary, germinated especially well. The latter, a handsome and not commonly seen plant, is deserving of a place in every medicinal garden.

Of the true mints, *Mentha piperita, M. spicata, and M. citrata* have done fairly well in a soil composed chiefly of coal ashes and clay. Growth in late summer, especially during drouth, tends to become wiry and small-leaved. *Mentha cana-*

densis, a wild mint with a pennyroyal-like odor, was brought from a New England brook to our semi-arid waste with unexpected success.

Collinsonia canadensis, largest of our common Labiates, transplants well. *Melissa officinalis* seems to rank next to the true mints for rapidity of propagation by artificial division; it does not stool out rapidity like the Menthas, but cuttings take root with very little encouragement.

Among medicinal shrubs we have confined our attention thus far chiefly to the genus Rhamnus. A hedge of *R. frangula* 160 feet long borders the south side of the pharmaceutical garden. This was purchased from a supposedly reputable nursery firm as *R. Purshiana*. The buckthorn, now in its second year, is growing vigorously. A smaller plantation of *R. cathartica* has proved less well suited to our environment. A few specimens of *R. Purshiana* obtained this year promise well. Our plans call for a considerable extension of the shrubbery plantation, with special attention to the native flora.

Among non-flowering plants we have transplanted *Dryopteris marginalis*, normally a species of semi-arid habit, with fair success. *Osmunda cinnamonea* and *O. claytoniana* proved to require more moisture in the soil.

Any reminiscence on the growing of medicinal plants would hardly be complete without a brief mention of our impatient competitor in the harvest—the insect. It is no new thing to center a discussion of insect damage about that important medicinal plant—the henbane. Job had his troubles, but he never tried to grow henbane. Flea-beetles reported for action on germination of seed. Aphids swarmed on the under surfaces of the low-growing hairy leaves to such an extent that it was almost impossible to reach them with nicotine sulphate. Regiments of potato beetles, old-fashioned, new-fashioned, and specially fashioned, throve in hearty, happy symbiosis despite hand picking and arsenicals. Final cohorts of destruction arrived in the shape of the hornworm—a voracious solanaceous plant pest that seems to require only twenty-four hours from the egg to convert a full-sized Hyoscyamus plant to a crawling mass of greenness as large as a man's finger. Southern tobacco planters have an iron-handed way of disposing of this succulent pest—a gentle snap of the fingers, and the hornworm dissolves, so to speak. The pharmacy student, especially in the feminine, lacks the ambition to master the technique of this operation—especially when the instructor refuses to provide a demonstration.

Other solanaceous plants, Stramonium and Belladonna, are much less apt, apparently, to be severely injured by insects. Stramonium is much punctured by flea-beetles, but grows too fast to be greatly damaged. Even the hornworm appears to meet his match in the Daturas.

Three species of Iris—*I. germanica*, *I. florentina*, and *I. versicolor*—have been most disastrously attacked by the larva of an insect which our state entomologist, to our consternation, gravely suspected of being the European Corn-Borer. It proved, fortunately, to be a less omnivorous insect, probably a species of *Macronostua*, which feeds frequently on the Iris and related species. According to the Bureau of Entomology, this insect rarely causes severe damage; it must have found our locality an unusually suitable habitat. Perhaps our dry soil and shade conditions may account for its unusual ravages here.

Plant-lice, besides damaging the henbane, have been particularly abundant on the flowering stalks of Valeriana, and on many of the Composites. On some of these,

as the burdock, little real damage was noted—it takes a good deal to damage a burdock—but Carthamus, for instance, was distorted almost beyond recognition, and quite failed to produce well-formed flowers. This species, by the way, was purchased from a seedsman as "Saffron," but the akenes which fell out of the opened envelope were a sufficient demonstration of the substitution.

While on the subject of Composites it may here be noted that *Grindelia squarrosa*, of a genus usually listed as perennials, appears here to be a biennial only.

The pathology of drug plants, for the most part little studied, is full of absorbing problems, and our limited area and limited experience have presented several. Our first-year henbane, surviving heroically the onslaughts of the insects, succumbed ignominiously to what appeared to be a mosaic disease. The extensive studies which have been elsewhere made on the solanaceous mosaics have not, so far as we have noted, reported it on this plant, and correspondence with the Bureau of Plant Industry has not revealed previous record of it. Tobacco growing near-by showed mosaic, and it is not impossible that the infective agent may have been transferred by aphids, some species of which have proved capable of transmitting similar diseases. A second-year planting of henbane on the same spot, for the purpose of studying this disease further, was quite exterminated by insects. Mosaic, however, appeared on Daturas in another plot, and caused considerable injury. If the disease appeared in the previous plantings of these species, it escaped our notice. Investigations of the alkaloidal characteristics of infected leaves have proved of considerable interest, and will be reported in another paper.

From a monetary point of view, of course, such a plantation as ours cannot maintain itself, but, from that point of view, neither can a university! It may be said, however, that many of our small-scale products have found a use in the assaying and dispensing laboratories of the school, in our hospital practice, and are serving as a basis for several more purely scientific studies.

SOLUBILITY OF VOLATILE OILS IN AQUEOUS MEDIA.

BY SIMON MENDELSOHN, PH.C., F.A.I.C., CINCINNATI, OHIO.

The experimental data recorded in this publication were obtained from investigations concerning the solubility of certain volatile oils in aqueous solution, with particular reference to the medicated waters of the Pharmacopœia.

The official type process for the preparation of aromatic waters[1] consists essentially of the three following consecutive operations briefly enumerated:

(1) Trituration of the oil with talcum.
(2) Addition of water with continued trituration.
(3) Filtration.

Digression from the official method relative to the empirical selection of the requisite absorptive media, is provisionally conceded upon conformity of the finished preparation with the authoritative requirements.

The descent of a solvent through the oil-impregnated absorptive during filtration, presents the fundamental aspects commonly involved in the extraction (washing) of a partially soluble precipitate. The amount of oil remaining in the

[1] United States Pharmacopœia, Rev. IX, page 60.

talcum, proceeding the passage of the solvent, is totally dependent upon the number and volume of the aliquot portions of menstruum applied.

The vertical pressure, in funnel filtration through conoidal paper, varies at every instant, and the area decreases three times as fast as the rate of diminution in the volume of the liquid contents. For example, when $^1/_2$ of the liquid contents has been filtered through, the filtering area has decreased to $^1/_6$ of the original exposed area.

The quantity of oil removed with each unit volume of filtrate is fairly constant, providing the temperature is consistent with the volatility of the components ordinarily involved.

The infinitely small amounts of essential oils in solution in the finished product considered in conjunction with their characteristic degree of volatility, cannot be determined by the usual methods of physical quantitative procedure.

Quantitative data were subsequently obtained by resorting to the usual volumetric chemical methods, which procedure was conducive to concordant results.

EXPERIMENTAL.

The average specific gravity of the official aromatic waters was determined as 1.009—subject to uniform laboratory conditions. The insignificant quantity of essential oil or its water-soluble constituents is not totally responsible for the elevation of the gravity factor. The specific gravity varies primarily commensurate with the purity of the talc employed.

The presence of considerable suspended matter derived from purified talc was proved by microscopic examination of residues obtained by evaporation of small quantities of the waters immediately proceeding filtration. The residual impurities in U. S. P. IX Talc can be further eliminated to a greater degree by a third or fourth repetition of the general method of purification.[1]

A saturated aqueous solution of oil of gaultheria was ultimately adopted as a criterion for future investigations alongthese lines. This was deemed advisable, in consideration of the distinct characteristic color reactions readily obtainable with the water-soluble constituent of the original oil.

Of the numerous volatile oils examined, gaultheria was found to possess the maximum volume of water-soluble matters, consisting of, from 85 to 99 per cent. of methyl salicylate $C_6H_4(OH).COOCH_3$[1:3]. A solution of ferric chloride produces a rich bluish violet coloration with water previously agitated with the oil.

The reaction affords ample facilities for the direct colorimetric quantitative method which was subsequently discarded in preference to the more adequate volumetric procedure.

The official assay process for gaultheria is based upon the determination of the intensity of the acid reaction by neutralization to phenolphthalein with alcoholic V. S. potassium hydroxide. A saturated aqueous solution of the oil was prepared according to the official type process, using a highly purified form of talcum. The methyl salicylate contents of the oil were previously determined by the U. S. P. IX Assay[2] to be 99 per cent. The filtrate was repeatedly percolated

[1] Remington, "Practice of Pharmacy," 1892, page 1171.

[2] United States Pharmacopœia, Rev. IX, page 272.

through the oil-talc mixture upon a strong porous filter medium to insure maximum saturation. The specific gravity of the filtrate was found to be 1.0065.

A $^{25}/_{0}$-cc portion of a representative specimen of the product was removed to an Erlenmeyer flask of $^{240}/_{0}$-cc capacity and $^{20}/_{0}$ cc of $N/10$ V. S. alcoholic potassium hydroxide added. Phenolphthalein T. S. was then added and the contents of the flask were thoroughly agitated, and then titrated with $N/10$ V. S. hydrochloric acid. Each cc of $N/10$ alkali consumed, corresponds to 0.015206 gram of methyl salicylate.

The filtrate was found to contain 0.060824 per cent. of methyl salicylate in aqueous solution, corresponding to 0.0001980 per cent. of gaultheria.

RESORCINOL AND PHLOROGLUCINOL AS COLOR REAGENTS.

BY E. V. LYNN AND F. A. LEE.

The polyhydric phenols have long been used in numerous reactions as agents for qualitative detection of a variety of compounds. The identification of methyl alcohol through its oxidation product, formaldehyde, the detection of sucrose in various food products, and the use of Seliwanoff's reagent in physiological chemistry might be cited as illustrations. We have been unable, however, to find any reference in the literature to a systematic record of comparative results with these compounds. Michael and Ryder[1] many years ago investigated the reaction of various phenols with aldehydes, but neglected to report the specific appearance in each case. During an extensive search for some means of identifying small quantities of cinnamic aldehyde in volatile oils, we had occasion to try the effect of an acid solution of resorcinol. The reaction was so striking that we were induced to investigate it further and, after quite a long series of tests, are much impressed with the possibilities of using phloroglucinol and resorcinol as agents for the detection and identification of a wide variety of substances.

The reagents which we finally selected as most satisfactory are one per cent. solutions of the phenols in concentrated hydrochloric acid. Most of the compounds tried were nearly insoluble in water so that alcoholic solution of the reagent might have seemed more promising. Nevertheless, we have found that the reactions are so sensitive that saturated aqueous solutions of the compound in question give just as reliable results. Both of these phenols of course absorb oxygen from the air and in time are rendered inert, hence the reagents used should be freshly prepared. We have found, however, that they will keep well if ordinary caution is used in protection. In order to make the tests equal volumes of the substance and of the reagents were mixed and allowed to stand. Most of the substances were tested in saturated aqueous solutions but formic, acetic and butyric aldehydes were used in 1% solution and vanillin, heliotropin, chloral hydrate and salicin were about one-tenth this strength, while dimethylaminobenzaldehyde was a 0.1% alcohol-water solution. The following table gives the description of the reactions observed.

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[1] *Am. Chem. Jour.*, 1887,. p. 133.

Oil or compound.	Resorcin solution.	Phloroglucin solution.
Cinnamic Aldehyde	Carmine-red color, later a red precipitate	Red color, later a deep red precipitate
Furfural	Yellow color, changing to a black precipitate	Same as resorcin
Formaldehyde	White precipitate, changing to old rose color and precipitate	Orange-colored precipitate
Paraldehyde	Cream-colored precipitate	Yellowish brown precipitate
Acetaldehyde	Cream-colored precipitate changing to dirty brown	Yellowish brown precipitate changing to dark brown
Oil of Citronella	Faint yellow color, finally white opalescence	Light red color, later a light red precipitate
Oil of Geranium	White opalescence	White opalescence
Benzaldehyde	White precipitate	Orange-yellow precipitate changing to light violet
Vanillin	Faint pink color developed after thirty minutes	Brownish red color after five minutes, precipitate formed
Butyraldehyde	White precipitate	Tan precipitate
Heliotropin	Negative	Red color, later a blood-red precipitate
p-Dimethylamino-benzaldehyde	Negative	Red color fading to a white precipitate
Eugenol	Negative	Pink color formed after a few minutes
Chloral Hydrate	Negative	Negative
Camphor	Negative	Negative
Salicin	Negative	Negative

It will be seen by an examination of the foregoing table that the tests are characteristic for all of the aldehydes, except butyric. The reactions are especially good for all of the aromatic aldehydes tried and could be used to identify any of them in mixtures. Cinnamic aldehyde can be detected by these reactions in such diverse substances as oils of cassia and cinnamon. This compound can be detected easily by means of the above reagents if present to the extent of 4% or better in the oil under examination, and when less is present, it can be detected if the test is allowed to stand a long time. This was ascertained by adding known amounts of cinnamic aldehyde to oil of turpentine. The latter oil alone gives negative results with the resorcin and phloroglucin solutions.

LABORATORY OF PHARMACEUTICAL CHEMISTRY,
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APRIL 16, 1923.

CHEMICAL EXAMINATION OF CEANOTHUS VELUTINUS.

BY E. V. LYNN, F. A. LEE AND W. H. CLAUSEN.

Being quite fairly wide-spread throughout eastern and western Washington, the sticky laurel has frequently attracted attention of the scientist as well as of the layman because of the waxy exudate and because of the strong odor at certain seasons. We have had occasion to experiment with portions of the plant during the past year and wish to report here the results of our preliminary examination. The work is to be continued and the complete report submitted later.

The material was identified by Prof. G. B. Rigg of the department of botany, University of Washington, as from *Ceanothus velutinus*, Rhamnaceae, commonly called Mountain Balm, Sticky Laurel, or Skunk Wood. The plant grows on very poor soil, usually on gravelly hills in dry spots. It is often associated with madrona. The leaves examined were collected about two miles from Silverdale, Washington, at the beginning of April 1922. Microscopical observations showed no stomates on the upper surface of the leaves but many on the lower. The epidermal cell walls were very thick and straight. The upper surface, but not the lower, was coated with a thick, sticky material, which dissolved readily in ether but was found to be insoluble in petroleum benzin. The leaves were dried in the air, then ground and submitted to a partial proximate analysis. Petroleum ether extracted 8.18% and ether dissolved from the residue 7.31% of the sample, the total extract being, therefore, 15.49%. The ash amounted to 3.75%.

The whole amount of the material at hand was then subjected to steam distillation, a very small amount of a dark brown oil separating from the product. The latter was thoroughly extracted with ether and the solvent removed by distillation. In this way we obtained a total yield of the brown oil equal to 0.1% of the fresh leaves. This oil had a specific gravity of 1.0157, an index of refraction 1.5315 and a boiling point about 218° C. Some decomposition took place at this temperature. The dark color prevented an accurate determination of the optical rotation but the examination indicated that the oil was inactive. The odor suggested the presence of cinnamic aldehyde, and possibly of eugenol, as did also a comparison of the physical constants.

	Sp. gr., 25° C.	$n_{D_{25}}$	B. p.	$[\alpha]_D$
Oil of *Ceanothus velutinus*	1.0157	1.5315	218° C.	0
Oil of Cassia U. S. P.	1.045–1.063	.....	.....	−1 to +1
Cinnamic Aldehyde	1.054–1.058	1.6195	252	0
Eugenol	1.064–1.070	1.5400	250–255	0

Using a cassia flask, it was found that 20% of the oil dissolved in water, 15% in sodium bisulphite solution and 55% in dilute potassium hydroxide solution, the latter figures corresponding to the amounts of cinnamic aldehyde and eugenol, respectively. The amount of oil available was not sufficient to separate and absolutely identify either of these substances, but all indications point to the correctness of our suggestion that cinnamic aldehyde, at least, is present. As a partial substantiation of this, it might be noted that the oil responded to the resorcinol test for cinnamic aldehyde as described in another paper.[1]

Up to the present time cinnamic aldehyde has been found mostly in plants of the Lauraceae. Quite rarely does it occur in other natural orders and then only in very small quantities.[2] The probable amount in the oil from *Ceanothus velutinus*, as above noted, is about 15%. This would suggest the possibility of using the oil commercially as a flavor and for pharmaceutical purposes.

LABORATORY OF PHARMACEUTICAL CHEMISTRY,
UNIVERSITY OF WASHINGTON,
APRIL 16, 1923.

[1] THIS JOURNAL, p. 418.

[2] Semmler, "Die Aetherischen Oele," Vol. IV, p. 225.

ANTISEPTIC LIQUIDS, POWDERS AND TABLETS.*

BY B. E. HÖCKERT.

During the last thirty years or so, a class of preparations has come into use intended to treat ailments of the mucous membrane. In the general trade and in the price lists of the pharmaceutical manufacturing houses appear a number of such preparations in the form of liquors, powders and tablets. Of course I am speaking of the many antiseptic preparations now in use. Three of them—all liquids—are now official in our Pharmacopœia. At least two of them were made official with the intention of having several preparations of this kind, of known standard formulas, always obtainable by physicians and their patients. While the official preparations are largely employed, the demand for the proprietary preparations is very much larger, and tablets and powders are generally preferred to the liquid preparations. One cause for this may be that the tablets and powders are dissolved at home and the application of them is more economical than the liquid preparations, but by conferring with patients on this subject I have been informed that they consider the dry preparations, to be mixed with water by the patients themselves, much more effective than those dispensed in liquid form. I have, from their first appearance, been very much interested in those preparations, and have always made them myself for personal use. Many experiences have taught me the reason for the dry preparations being the most popular and, I dare say, it is because the solutions made at home from them are free from alcohol, glycerin and coloring matter.

There are on the market to-day two distinct classes of antiseptic preparations—the alkaline and the acid ones. The former are the most numerous and the most used, and so I shall consider them first. The base in all of them is strong alkaline salts, such as potassium bicarbonate or sodium bicarbonate; in addition sodium biborate, sodium chloride, sodium benzoate, sodium salicylate and, as a rule, eucalyptol, menthol, methyl salicylate and thymol. Some manufacturers make minor changes in composition, but these are not of very great significance. The liquid preparations contain, besides water, glycerin and alcohol, and occasionally some coloring matter. Preparations vary somewhat in composition, but conform quite closely.

These preparations are intended, first, to thoroughly cleanse the mucous membrane of the organ they are applied to, generally the nose, throat or vagina; therefore, they must be strongly alkaline. This, of course, is somewhat objectionable to some people, but if they are to do the work for which they are intended, it cannot be helped or overcome. The second effect is to allay inflammation and irritation of the mucous membrane, and they must be antiseptic; this is the purpose of the borate, benzoate, salicylate and the antiseptic aromatics. Many people object to the taste of these preparations, some even are nauseated by the use of them; sodium benzoate is the probable cause, and this effect is difficult, if not impossible, to overcome. Some propose eliminating one or the other of the antiseptic aromatics and salts. The most objectionable ingredient is, without doubt, thymol. It may be omitted and a very small amount of oil of cloves added instead; thereby the flavor will be very much improved; by omission of the menthol the taste is not improved and the Eucalyptol is too valuable an antiseptic to be omitted.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Cleveland meeting, 1922.

I present a formula for an antiseptic powder that, in my opinion, leaves little to be desired:

Sodium Bicarbonate	Gm.	50.00
Sodium Chloride	Gm.	25.00
Sodium Biborate	Gm.	25.00
Sodium Benzoate	Gm.	5.00
Sodium Salicylate	Gm.	5.00
Eucalyptol	Gm.	1.00
Menthol	Gm.	1.00
Methyl Salicylate	Cc	1.00
Oil of Cloves	Cc	0.30

Half a teaspoonful in a glass of water will make a pleasant mouth wash and gargle, and a good nasal spray. For a douche about one teaspoonful to a pint of water is very effective.

The Liquor Antisepticus Alkalinus of the National Formulary is a very good preparation; the red color is objectionable and should be eliminated. The amount of glycerin is still too large and ought not to be more than 3 percent. The alcohol can be cut down to 5 percent. or less. If the taste is objectionable, the oil of thyme can be displaced by the same amount of oil of cloves.

The second class of antiseptic preparations I have not seen in dry form, although some such preparation may be on the market.

I make for the hospital here one such dry preparation, which is generally used for douches; occasionally it has been given to patients for use as a mouth wash and a gargle. Here is the formula:

Boric Acid	Gm.	125
Benzoic Acid	Gm.	15
Sodium Biborate	Gm.	40
Eucalyptol		
Menthol		
Methyl Salicylate, of each	Gm.	1

The present formula of the National Formulary for Antiseptic Solution is not a good one. First, the amount of alcohol is ten times as large as necessary, then the benzoic acid has been changed to sodium benzoate and sodium salicylate. The formula I use is as follows:

Acid Boric	Gm.	30
Acidum Benzoic	Gm.	3
Sodium Biborate	Gm.	10
Eucalyptol		
Menthol		
Methyl Salicylate		
Thymol, of each	Gm.	1
Alcohol	Cc	30
Glycerin	Cc	30
Water to make	Cc	1000

This makes a most excellent mouth wash and gargle; diluted with equal parts water it is a good nasal spray, and douche. If the taste is not satisfactory, the thymol can be displaced by oil of cloves, 0.30 cc.

I have made many experiments with antiseptic preparations and one of the very best is Dobell's Solution, N. F. A culture from germs found in the mouth is excellent to test the value of an antiseptic; the growth in such a culture was stopped by half its quantity Dobell's Solution. It requires equal parts of the Antiseptic Solution after above formula, double the quantity of the culture of the Antiseptic Solution of the National Formulary, but only equal parts of the Antiseptic Solution U. S. P. VIII. The Alkaline Antiseptic Solution is considerably less effective as an antiseptic, but is effective as a cleanser.

HARTFORD, CONN.,
JULY 1922.

THE HOSPITAL PHARMACY.*

BY W. H. FORD.

The Pharmacy at Lakeside Hospital is one of its busiest units. We have developed it during the past few years into a producing pharmacy, rather than a distributing depot for popular pharmaceuticals. The School of Pharmacy is now taking up much of this work and during the next year will not only give to their student-body real experience in quantity production of medicinal preparations, but give to the hospital a better quality and standard of supplies at a reduced cost.

The work of producing for the various wards and services, their medical supplies, is a real work requiring the strictest attention; comprising as it does a daily average of 250 patients, it really represents the demands on a retail drug store of 250 families.

The morning work is devoted to filling requisitions from wards and operating rooms. Requisitions coming to the pharmacy must have been passed by the supervisor of nurses, and assistant director—no goods are furnished without their O. K. Requisitions are made in duplicate, original is retained by the pharmacist and duplicate returned with goods to be checked by the nurse receiving on the ward.

Narcotics are furnished in quantities of 25 tablets, pills, etc., only. Each 25 tablets or pills is accompanied by a slip containing spaces for 25 entries. Entries on the slip must be made by nurse administering, time given, name of patient, name of nurse and medical service. No further supplies are furnished until this slip is returned to the pharmacy, signed by the head nurse in charge of the ward, with each tablet or pill accounted for. Each slip is numbered as sent out and a record is kept allowing us to tell in a few moments the narcotics on any given ward, and also simplifies stock keeping.

The hospital management has coöperated with the pharmacy in reducing to the minimum the prescribing and use of liquors in the hospital. Although a nominally 300-bed hospital our request and Government permit allows us 10 gallons of whisky and 5 gallons each of port and sherry wine every 3 months. This amount has never been exceeded and the use has fallen to such an extent that during the month of July just past, the total amount of stimulants furnished all the wards was 1080 cc of whisky and 250 cc of port wine. These were used almost

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Cleveland meeting, 1922.

exclusively by donors for blood transfusion. Control is gained by the same method used with narcotics. The Government allowance of 8 ounces covering a period of 10 days works very nicely for a private ward, but in an open ward with 20 or 30 patients it might bring several bottles to the ward at the same time which would make accurate checking impossible. We therefore furnish 250 cc to each ward with slip attached. The visiting physician records the orders on the ward register for the patients' requirements each 24 hours. No further supplies are furnished until this slip is returned with record of amount and time given, name of patient and nurse giving.

Preparation of solutions for sterilizing is a daily duty. Saline Solution is prepared in large quantities in a specially designed machine. All solutions for hypodermic and local anesthetic use are put up in ounce bottles, cloth capped and marked with special ink, which changes color on passing through the autoclave, providing a perfect check.

Dakin's Solution, which at times is used in large quantities, is freshly made daily; any remaining on wards the following morning is returned for new supply.

All photographic solutions used in the X-ray, pathological and cardiographic laboratories are made in the pharmacy.

Our force consists of a chief pharmacist, an assistant pharmacist and helper. We have no resident pharmacist. Emergency supplies are always available to hospital supervisors. The School of Pharmacy is also supplying students for hospital assistants during the school year. This gives the student not only real hospital experience but an experience in dispensing not to be gained in the average drug store.

Our out-patient department, or dispensary, is cared for each afternoon from 2 to 6 P.M. by the pharmacy force. It is a place of real action as it is the largest in the city. During the past year we had 106,000 visitors; 60 per cent. of this number were medical cases and given medicine.

Our Formulary contains 93 formulas; about 50 of these are used daily and are kept prepared for immediate dispensing. Visiting physicians are not restricted to this list of formulas so that hundreds of prescriptions covering all phases of pharmacy are offered. The compounding and preparing of these articles is a work and schooling in itself and is of the very greatest value to the aspiring pharmacist.

Although hundreds of prescriptions are furnished free to deserving patients, and range of prices is merely nominal, our ability to produce the majority of these medicines in our own work rooms makes the drug department of the dispensary an asset.

Night clinics held on three evenings each week are devoted to skin and venereal diseases only and are cared for, in the drug line, by the pharmacist.

Drug purchases at Lakeside include also surgical instruments and supplies are under the direct supervision of the chief pharmacist; orders are placed by him through the hospital council or directly with producers. The budget system prevails. The pharmacist makes his estimates for yearly expenses and expenditures and his standing is reported monthly by the auditor. Drugs and supplies in dispensary service are all furnished through the pharmacy and charged to it as a separate unit. Requisitions for surgical instruments and supplies for operating

rooms and wards are priced each month by the chief pharmacist and passed to the auditor's office.

The position of pharmacist in a modern hospital should appeal to many young men. The field is enlarging each year and although he may never have his name emblazoned over the door of an emporium with a window full of hair nets, boxing gloves, etc., with a few drugs concealed in "Our Prescription Department," he will have the satisfaction (and really this is all we get out of life) of offering to real suffering humanity the benefit of his learning and experience. As hospital pharmacist he is brought into daily touch with the best surgeons and doctors; he is relied upon to answer innumerable questions relating to his profession from interns and nurses. He has access to experimental laboratories, is able to test either chemically or physiologically any new remedy or old ones for value or strength.

I deem a word of appreciation for Dean Edward Spease of the Cleveland School of Pharmacy in order for his labor in bringing to the front this phase of pharmacy. During the past year he has produced a working condition in the school of the greatest benefit to all Cleveland hospitals. In the near future he will not only furnish finished supplies but help to all hospitals from the school and student body.

In Dr. A. R. Warner, formerly superintendent of Lakeside Hospital, but now secretary of the National Hospital Association, we have an active exponent and friend of our cause. Although until recently he has considered that the hospital pharmacist should be affiliated with the hospital association, a recent conversation with him gave assurance of his belief that the American Pharmaceutical Association is its rightful home.

I am hopeful that this brief paper may open the minds of some to the advantages of hospital pharmacy. It is anything but a disagreeable proposition and to-day offers many inducements; it is not discouraging from a financial standpoint if a man is ready for good hard work.

There is not a hospital pharmacist to-day, competent to demonstrate to the management of that hospital the possibilities of his position, who cannot secure the support of the management and persuade it to work, as they do at Lakeside Hospital, heart and soul with the pharmacist as long as he shows himself a real producer.

BUYING FOR THE HOSPITAL PHARMACY.*

BY FRANCIS M. GREENWALT.[1]

Buying for the hospital pharmacy is a subject about which one might write much and still say little that would be of help to a buyer for some other hospital. As in buying for any other commercial business we are always learning something that makes us more valuable to the employing institution.

The first thing to realize is that we are not infallible and can make some unwise purchases. I have been buying for one hospital for more than three years

* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., Cleveland meeting, 1922.

[1] St. Luke's Hospital, St. Paul, Minn.

and realize that there is still something for me to learn in the business of hospital buying. Almost every salesman who calls on us is in a position to give valuable tips and for that reason, if there were no other, it is well to give each one an audience.

I know that it sometimes appears to the hospital superintendent I am spending undue time conversing with salesmen but I do not consider time thus spent as a loss to the institution. I can cite many specific instances where salesmen have been of very great help to me, and they would not be able to give such help, or even be willing to do so, if they had been refused an interview. During a conversation with one who sold disinfectants, he inquired how much cresol solution we used in a year. When I told him, he was astonished and replied that we were using more than the city and county hospital, which has a bed capacity about five times as great as ours. His remark set me thinking. I told the superintendent that there must be a great waste in the product here, and investigation proved this to be the case, and thereafter we were able to get along with about one-fifth the quantity used before.

Occasionally when a salesman calls it seems a waste of his time and mine to even look over a few samples or a price list, but it is at just such times that I have been shown a new device or instrument far superior to some older type that has been used in the hospital for years past. It is a fact in psychology that human nature is opposed to changes; we all form habits which seem a part of us and we revolt at any factor causing a change in daily routine; just so it is in the hospital—a certain article is used for no other reason that this—"Well, we have always used that kind."

When I find some device that seems a decided improvement on one that was previously used, I buy just one or two of the new kind, and gradually get it into use by substitution. It isn't long before the doctors and nurses are asking for the newer device, thinking they have made a discovery of their own. In the manner just illustrated we have replaced the older plunger syringe—which was more difficult to sterilize and usually leaked—with the newer plungerless syringe, which is easily sterilized, and more economical because either the glass barrel or rubber bulb can be replaced.

Of all products purchased by the hospital pharmacist, I think rubber goods require the most careful attention. There is always something to learn about it, and until we know these factors we are likely to make some "poor buys." Fresh rubber goods has a limber and smooth texture, while that which is old is stiffer and rougher; there is also a difference in the odors of fresh and aged rubber goods. It is well to demand a period of guarantee with such articles as water bottles, ice caps, air cushions and rubber sheeting, and these articles should never be bought in quantities so large that they will be on the shelf for more than a few months, even though they are offered at a special price in gross lots to induce buying. I have found that it is poor economy to purchase such goods when priced unusually low. As a rule they do not give service, owing to poor construction; nothing is much more annoying than a leaky water bottle or ice cap, an air cushion that will not stay inflated, or rubber sheeting that loses its color to the bedding—I lost both time and patience trying to keep ice caps and water bottles in working order, until I learned to buy the very best of each.

Surgeons' gloves also must be purchased carefully. An inferior glove is worse than useless, for it causes trouble and delay in the operating room. Our surgeons are now requiring a heavy weight glove in preference to a medium weight, and since the former are much more expensive than the latter, I have substituted a household glove which was recently brought to my notice. The last-named glove has the required weight and durability and is much cheaper than the regular surgeons' glove.

In the buying of hospital enamel ware one must also be willing to pay the higher prices. Cheaper ware chips quite easily and as soon as the iron base is exposed it is unsafe to use for many solutions owing to chemical reaction. Sometimes the patient is injured by the use of chipped enamel ware; the reputation of the hospital is then at stake, just because of too rigid economy.

Here I also wish to mention the chances that are taken by the use of inferior hypodermic needles—a poor needle that is not properly tempered may either bend or break when the nurse is using it. Hypodermic injections are unpleasant and dreaded by the patients under the best condition, but when a needle bends or breaks, it is a dangerous situation for the patient and a most embarrassing one for the nurse. Buying well-known makes of needles insures getting the best.

Shortly after the war when the market was flooded with poor thermometers, our superintendent purchased a gross that were guaranteed to be accurate—a few dozen of them were put on the floors but it was some little while before the nurses detected their inaccuracy; some of them registered as much as two degrees above normal—we then returned all these thermometers for replacement with reliable ones. No great harm had been done but the above serves to illustrate the necessity for buying individually standardized thermometers.

On the buying of drugs and pharmaceuticals proper, I believe the least need be said. Our pure drug laws protect us from inferior products and any live pharmacist knows the most reliable drug concerns by reputation. One mistake that the inexperienced buyer often makes is buying in too large quantities. Unless the buyer can safely judge just how soon a given supply will be exhausted, it is well to buy in small quantities. Deterioration must always be considered as well as the money invested and tied up in drug stock; then, too, there are fads in medicine. In a few years' time one can notice a wide range in the different drugs used for the same kind of medication. Three years ago the doctors used Epsom salt, Hinkle's pills, cascara and mineral oil, as cathartics in our hospital; comparatively, very little of these drugs is now used; instead, solution of magnesium citrate and various natural and artificial mineral waters are given. Some of my predecessors must have bought in rather large quantities for I found considerable over-stock and dead stock.

There are, however, some drugs that can be bought at a great saving in quantity provided the pharmacist can estimate his wants. The pharmacist who has the time should make most of the official preparations; by doing so, he saves money for the institution and avoids overstocking.

The subject of patronizing home trade has often been discussed by our board members. If the local jobbers can give as good prices, quality, and service as the remote dealer, by all means they deserve the hospital's business. Errors are more easily corrected and exchanges made when dealing with the home jobber. How-

ever, I have found that the home merchants sometimes feel that they are indispensable and are very indifferent about service; they are repeatedly out of some merchandise that is needed without delay. I have spent some anxious days worrying over depleted stock that the jobber could not replace.

In many hospitals pharmacists do not have the privilege of even buying the drugs. In my opinion this is a great mistake, for no one is better informed regarding them, if qualified, than the pharmacist. I do not see how he can keep posted on prices if he is not buying. Nor can he keep interested in his profession if he is only acting as a "mechanical mixer" of drugs. I know a private hospital where the pharmacist makes her requisitions to one who acts as official buyer for the entire hospital. Her requests are sometimes overlooked, and again his purchases are made to accommodate certain individual salesmen or concerns rather than to save money for the institution. A pharmacist working under such conditions is indeed handicapped. I surely cannot conceive how any individual can be so versatile as to be able to buy intelligently and wisely for every department in the hospital from the attic to the basement. I think buying for the hospital pharmacy should be left to the pharmacist alone.

RESEARCH NOTES ON STABILITY OF ELIXIR LACTATED PEPSIN, SOLUBILITY OF CHLOROFORM IN SIMPLE SYRUP, U. S. P. OINTMENT OF ZINC OXIDE WITH PETROLATUM BASE, AND FLUIDEXTRACT OF GLYCYRRHIZA—SUGGESTION FOR AN IMPROVED FORMULA.*

BY FREDERICK J. AUSTIN.

STABILITY OF ELIXIR LACTATED PEPSIN.

A ruling by the Prohibition Commissioner, issued early in June 1920, placed those alcohol-containing liquid pepsin preparations, which contained less than 8 grains of standard pepsin U. S. P. per fluidounce, in the beverage class. As a result manufacturers faced the alternative of discontinuing many of these products or of making a decided increase in their pepsin strength.

A manufacturer generally does, and should always, possess reliable data regarding the keeping qualities of his products. This is particularly necessary with the liquid preparations of animal enzymes. On account of the decided increase necessary in the pepsin content of many Elixirs of Lactated Pepsin, if they were to be marketed at all, experiments were undertaken with the idea of determining the stability of these altered preparations under ordinary storage conditions.

In view of the specific nature of the new requirement and of the unavoidable slight variations in assay results due to the personal equation, it was decided that such preparations could not be manufactured and sold with safety if they contained exactly 8 grains of enzyme per fluidounce, but that they should represent at least 10% above the required label claim of 8 grains per fluidounce.

Accordingly, two one-gallon samples were set aside, the first of which represented a lot of the elixir in question containing 8.8 grains of official pepsin per fluidounce. An alcohol determination on this sample showed the presence of 11.72% absolute alcohol by volume, the label claim being 12%. A second gallon sample was pre-

* Scientific Section, A. Ph. A., Cleveland meeting, 1922.

pared, containing 7.4 grains of official pepsin per fluidounce and sufficient pancreatin U. S. P. and diastase U. S. P. to make a total enzyme content of 8.8 grains per fluidounce. This elixir contained 14.92% absolute alcohol by volume, being intended to contain 15%.

At the outset both elixirs when assayed by the official method for pepsin showed the proper pepsin strength, all but a trace of the coagulated egg albumen being digested in each of the duplicate trials. Thereafter each sample was treated as a routine job, both having been made from materials regarding the strength of which the Ferments Manufacturers made a definite claim which claim was confirmed when the products were purchased. The presence of enzymes other than pepsin in the second sample was ignored. It should also be noted that above samples exhibited the usual pleasant flavor and odor which one associates with these elixirs.

These assays and examinations as regards physical condition were repeated monthly, the period of observation dating from July 15, 1920. The results were satisfactory for one year, there being during that period no marked increase in the amounts of undigested egg albumen nor any perceptible deterioration as regards flavor or odor. On the fourteenth trial, that of August 15, 1921, however, the pepsin assays were failures, between two and three cubic centimeters of coagulated egg albumen remaining undigested. The odor of each preparation was offensive and the taste nauseating.

The indications are, therefore, that, under the conditions prevailing, Elixir Lactated Pepsin made with 8.8 grains of digestive ferment to the fluidounce (pepsin alone or pepsin combined with small quantities of pancreatin U. S. P. and diastase U. S. P.) should not be dispensed if more than one year old.

SOLUBILITY OF CHLOROFORM IN SIMPLE SYRUP U. S. P.

Pharmaceutical manufacturers frequently prepare various non-alcoholic syrups having essentially the density of U. S. P. Simple Syrup which are claimed to contain a specific amount of chloroform per fluidounce. These claims, at times, seem ridiculously high, particularly when they call for four or more minims per fluidounce. Syrup White Pine Compound with Chloroform may be mentioned as a typical example of the class of syrups referred to.

According to the ninth revision of the U. S. Pharmacopœia one part of chloroform is soluble in 210 parts of water. Slightly less than 2.3 minims, therefore, should be soluble in 1 fluidounce (480 minims) of this solvent.

On the surface at least this official statement alone controverts claims calling for the presence of three or more minims of chloroform in solution in the specified quantity of non-alcoholic syrups. The question may be raised as to whether the presence of the sugar increases its solubility.

With the idea of investigating this problem, seven graduated cylinders of practically the same capacity and having perfectly fitted stoppers were three-quarters filled with Simple Syrup, having a specific gravity of 1.31 at 25° C. These were numbered from one to seven and to the first was added one minim of chloroform to the fluidounce, to the second, one and one-half minims per fluidounce, etc., by half-minim steps to 4 minims of chloroform per fluidounce in cylinder number seven. These were frequently and vigorously shaken for one week. The chloroform in numbers one and two containing, respectively, one minim and one and one-

half minim per fluidounce promptly dissolved and that in number three, which contained two minims per fluidounce, eventually disappeared completely. Varying amounts of chloroform dependent, of course, on the quantities added remained undissolved at the end of the period of agitation in the remaining cylinders. After standing for forty-eight hours, to allow for complete separation of undissolved chloroform, ten cubic centimeter duplicate samples (*a*) and (*b*) were drawn from each cylinder for assay, the dissolved chloroform being separated by distillation with alcohol, decomposed under pressure with alcoholic potassium hydroxide and the resulting potassium chloride titrated with tenth-normal silver nitrate V. S., a blank determination being run for the amount of alcoholic potassium hydroxide used in each assay and results corrected accordingly.

TABULATION OF RESULTS OF ASSAY.

No. of cylinder.	Minims $CHCl_3$ per fluidounce.	$N/10$ $AgNO_3$ V. S. Consumed by 10 cc samples.	Minims $CHCl_3$ found per fluidounce.
1	1	(*a*) 7.43 cc	0.96
		(*b*) 7.90 cc	1.02
2	1.5	(*a*) 11.52 cc	1.49
		(*b*) 11.20 cc	1.45
3	2	(*a*) 14.25 cc	1.84
		(*b*) 13.63 cc	1.76
4	2.5	(*a*) 13.55 cc	1.75
		(*b*) 14.25 cc	1.84
5	3	(*a*) 13.94 cc	1.80
		(*b*) 14.40 cc	1.86
6	3.5	(*a*) 13.32 cc	1.72
		(*b*) 13.86 cc	1.79
7	4	(*a*) 13.48 cc	1.74
		(*b*) 13.32 cc	1.72

Calculations were based on the following: Weight of 1 minim of chloroform—0.0911 Gm.—1 cc of $N/10$ $AgNO_3$ V. S. equals 0.0039796 Gm. of chloroform.

The average solubility shown in those determinations to which 2 or more minims of chloroform per fluidounce had been added was 1.78 minims.

Trials of a similar nature were made on request by another chemist who attempted to dissolve one, two, three, five, six and ten minims of chloroform in one fluidounce of Simple Syrup U. S. P. He found that two minims or less dissolved in such syrup without leaving a perceptible trace of undissolved chloroform. His assays of those specimens to which he had added between two and ten minims chloroform per fluidounce showed amounts ranging from 1.60 to 1.79 minims chloroform per fluidounce.

It would appear therefore that the presence of sugar in solution does not increase, but rather retards the solubility of chloroform in Simple Syrup and we are forced to conclude that claims of the presence of more than two minims per fluidounce in non-alcoholic syrups of the above-mentioned density are erroneous and that its addition is not only useless but wasteful.

OINTMENT OF ZINC OXIDE WITH PETROLATUM BASE.

For the manufacture of Ointment Zinc Oxide, the Pharmacopœia directs that the zinc oxide be rubbed with about one-fourth of the required amount of melted benzoinated lard in a warmed container, that the remainder of the ben-

zoinated lard, previously melted, be incorporated with this mixture and the whole thoroughly stirred until it congeals.

According to the same authority, the melting point of lard may range from 36° to 42° C. It contains no specification as regards the melting point of benzoinated lard, but market products of this item usually melt between 36° and 37° C.

Ointment of Zinc Oxide made with benzoinated lard frequently becomes so soft in hot weather that it is in no condition for shipment and at times a considerable separation of zinc oxide takes place. Also the ointment is prone to take on a granular condition and, in spite of the fact that the lard is benzoinated, it often becomes quite rancid.

Experimental lots of the ointment were made in which the benzoinated lard was replaced with the so-called Lily White and Snow White petrolatums of the market, which melted at from 41 to 42° C. (the upper limit for lard). The color of these petrolatums varied from pale yellowish white to pale greenish white. The resulting ointments were of good color and did not become rancid or granular, but they showed evidence of separation when heated over night at 107° F. (41⅔° C.). Specimens were then made of the proper oxide strength containing 5%, 10% and 15% of paraffin, respectively, with the result that the first showed separation on heating to the above-mentioned temperature, and whereas the last two did not, they became so firm on cooling to a temperature of 60° F. for six hours that they would not flow from collapsible tubes under ordinary pressure.

The problem narrowed down to the finding of a white petrolatum with a higher melting point, one which did not become too firm when reasonably cool. Such a product has been found to be available with a practically constant melting point (47° to 48° C.) and almost without color. It yields a white ointment which stands prolonged heating not only to 107° F., but to 110° F., without separation and which may also be cooled to 60° F. without becoming unduly firm.

FLUIDEXTRACT OF GLYCYRRHIZA.

(Suggestion for an Improved Formula.)

For the manufacture of this Fluidextract, the U. S. P. directs that 300 cc of 10% ammonia water be mixed with 2700 cc of chloroform water and that 1000 Gm. of glycyrrhiza, No. 20 powder, be moistened with this menstruum. The drug is then packed in a percolator, saturated with the above liquid, macerated for 48 hours and percolation then carried to exhaustion, reserving the first 500 cc of percolate and evaporating the remainder to a soft extract. This soft extract we are directed to dissolve in the reserve, adding if necessary a few drops of ammonia water as an aid to solution. Alcohol, 250 cc, is then added, the fluid put aside for 7 days, the clear liquid decanted, the remainder being filtered and the filter washed with a mixture of one volume of alcohol and three volumes of water sufficient to yield 1000 cc.

The concentration of the weak percolate obtained above yields a very acid, difficultly soluble soft extract. When mixed with the reserve, which by the way contains a small amount of chloroform which is not removed, is diluted to 750 cc with water and brought to volume with alcohol, this soft extract is responsible for the excessive sedimentation which occurs during the specified period. The prep-

aration often becomes almost gelatinous, efficient filtration is impossible, and the average yield on a manufacturing scale is 25% of the theory.

Various experimental lots were made in accordance with specifications with like results. Trials were then made using in turn, as extracting menstruums, cold water, chloroform water, water at 40° C., at 60° C., at 80° C., at 90° C., and finally boiling water, eliminating the ammonia water entirely. Chloroform water, aside from its preservative action, showed no advantage over distilled water at the same temperature. As the temperature of the extracting menstruum was raised, there was noticeable a marked decrease in the amount of the albuminous material present and filtration at the end of the process was observed to be increasingly rapid. With boiling water this substance gave practically no trouble.

Several large batches of this fluidextract have been made without difficulty and, after the lapse of more than a year, the condition, flavor and odor of the record samples are entirely satisfactory.

The working formula is as follows:

FLUIDEXTRACT OF GLYCYRRHIZA.

Glycyrrhiza No. 20 powder	1000 Gm.
Alcohol	250 cc
Boiling Water q. s.	
Cold Water q. s.	

Moisten 1000 Gm. of Glycyrrhiza with sufficient boiling water, pack in percolator, cover with boiling water and macerate, keeping hot over night. Percolate to exhaustion with boiling water, reserving first 500 cc collected. Evaporate weak liquor to a soft extract, dissolve in reserve and, if necessary, make up to 750 cc with water. Gradually add 250 cc of alcohol with constant stirring, let stand one week, siphon off clear fluid and filter remainder, wash residue on filter with q. s. of a mixture of one volume of alcohol and 3 volumes of water to make 1000 cc.

Precautions must, of course, be taken during warm weather to keep the reserve percolate sweet.

This formula has been submitted to the U. S. P. Revision Committee with the recommendation that it receive consideration.

LABORATORY OF WILLIAM R. WARNER & CO., INC.,
NEW YORK, N. Y.

VOLUME PRODUCTION PHARMACY.*

BY WILLIAM H. GESELL.

The phrase, *Volume Production Pharmacy*, applied in this way, may be new to you, and it is really an entirely different type of pharmacy than you and I were taught in college.

Volume Production Pharmacy is the result of the present trend of pharmacy. Formerly, when a person went into a drug store and purchased pharmaceutical preparations, he patronized that drug store because he knew the proprietor, knew of his training, knew that his preparations were made by him in a careful, scientific and honest manner—he depended on his honesty for their reliability. Perhaps this condition would have continued indefinitely as it has in other countries where there are laws that the pharmacist must be the individual owner. But in the

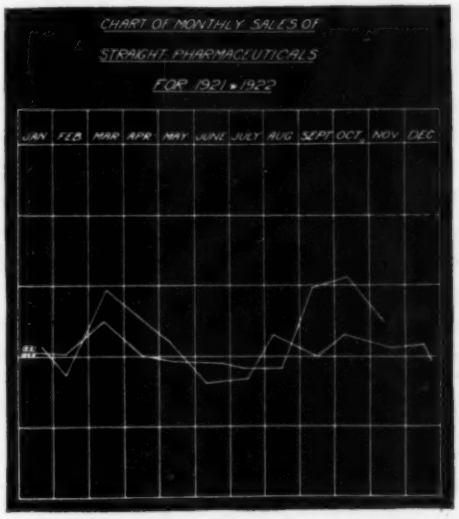
* Parts of an address before New York Branch, A. Ph. A.

United States, the "Merchandising Drug Store" has changed the pharmacist from a scientific plodder to a scientific super-salesman. I know of cases where in certain stores clerks make as high as eighty sales an hour.

The laws of most States demand—and rightly demand—that a pharmacist should have a scientific training and certain experience before he is licensed. But because he has become a super-salesman, with scientific training, and because his time as a salesman is more valuable as such, he buys most of his pharmaceuticals. This places the burden of the responsibility of the large production of pharmaceutical preparations on the wholesale manufacturer, and a serious responsibility it certainly is.

A passing tribute must be paid to the old-time druggist—he worked unlimited hours, waited on his customers spasmodically as they came in, passed the time of the day with them, filled prescriptions, manufactured his own preparations, general pharmaceuticals and sometimes chemicals in a small way, and in the evenings, in that room back of the store (I am sure some of you remember these rooms), he rolled pills of Blaud's Mass, etc., and read of the newest achievements in pharmacy in the many trade papers to which he subscribed.

Volume Production Pharmacy carries with it grave responsibilities. Preparations which the wholesaler prepares must be of a quality acceptable not only as Pharmacopœial preparations but must also pass the various State requirements, which are sometimes impossible. They must please the eye of the purchaser and, very peculiarly, quite a few pharmacists are not of the same opinion as to just how a preparation should look. *Volume Production Pharmacy* demands of the manufacturer that he must produce superb, correctly labelled, properly analyzed, compatible preparations, and he must compete with many small manufacturing concerns whose stock in trade is a cellar and a few crocks; the preparations are mixed by the owner, peddled by the son, packed by the children, and the preparations are often of nondescript quality.



Selling Curve.

The selling curve of pharmacy is approximately as given in the chart, but, of course, the graphic curve only shows more or less the seasonal trend. It has even a greater disadvantage because there are many more fluctuations than actually given here. The significance of this curve shows that *Volume Production Pharmacy*, therefore, has to have for its aim an intelligent plan of work so as to give the best quality and prompt service to its customers.

It is easy to say, "Well, simply manufacture preparations during dull times that are going to be in demand during the succeeding busy period." To a great extent this course is followed but the problem is really not so easy.

An epidemic in any season will completely upset well-arranged plans and, therefore, such emergencies must be prepared for. Many preparations require special attention—some age, others decompose from aging, some discolor—all of these difficulties have to be overcome so that permanent, quality preparations can be delivered at all times.

In a concern where only a few standard preparations are manufactured, and economists say that this is the best way, the problem is not a serious one. But in our business—where we manufacture five thousand different pharmaceutical preparations, and where we have, besides our regular production, dedicated a full department to those out-of-the-ordinary preparations which a druggist might want in a hurry—these factors create a very complicated problem.

You may say that this is stretching the point of giving service. Service has been defined by its component letters—"S" is for *Service*, "E" is for *Education*, "R" is for *Resourcefulness*, "V" is for *Vision*, "I" is for *Intellect*, "C" is for *Courage*, and "E" is for *Enthusiasm*—all of these ingredients of Service enter in *Volume Production Pharmacy*.

The factors which influence *Volume Production Pharmacy* are as follows:

1. Unstability of the markets on raw materials.
2. Control of stocks of finished and unfinished goods.
3. Over-production and under-production.
4. Experienced operators.

Formerly, in the drug store, the unstability of the market never worried the pharmacist. In *Volume Production Pharmacy* the complexity of this situation is a terrific one. Prices go up and down in a very short period; the keeping of large stock is a financial impossibility, and, therefore, careful buying is of paramount importance. Coupled with this is the control of stock, both of the finished and unfinished goods. In order to be able to cope with the many difficulties that arise in *Volume Production Pharmacy* it became necessary in our case some years ago to develop a general control system. To be able to follow any order from the time it arrives to the time it is delivered, watch the orders to find out how often an order repeats itself in a given period and thereby predict unexpected rushes, etc., and to do this without overburdening oneself with unproductive help is a serious problem. For after all the pharmaceutical super-salesman is still a pharmacist and, if the prices rise above what he thinks they should be, he can and will manufacture such items.

Therefore to produce economically, it means to "Taylorize Pharmacy." It is a very simple plan to apply the principles of Frederick W. Taylor to a machine shop where a limited number of items are made with a given number of operations and where the constants seldom vary, but *Volume Production Pharmacy* depends so much on the type of merchandise received at a particular time that it is very difficult to adapt positive and given rules for every situation.

The principles of Mr. Taylor consist of the following:

Firstly.—The development of a science for each element of a man's work, thereby replacing the old rule-of-thumb methods.

Secondly.—The selection of the best worker for each particular task and then training, teaching and developing the workman, in place of the former practice of allowing the worker to select his own task and train himself as best he could.

Thirdly.—The development of a spirit of hearty coöperation between the management and the men in the carrying on of the activities in accordance with the principles of the developed science.

Fourthly.—The division of the work in almost equal shares between the management and the workers, each department taking over the work for which it is the better fitted; instead of the former condition, in which almost all of the work and the greater part of the responsibility were thrown on the man.

As to the second principle—the selection of the best worker—I need hardly discuss that because it would fill many a paper.

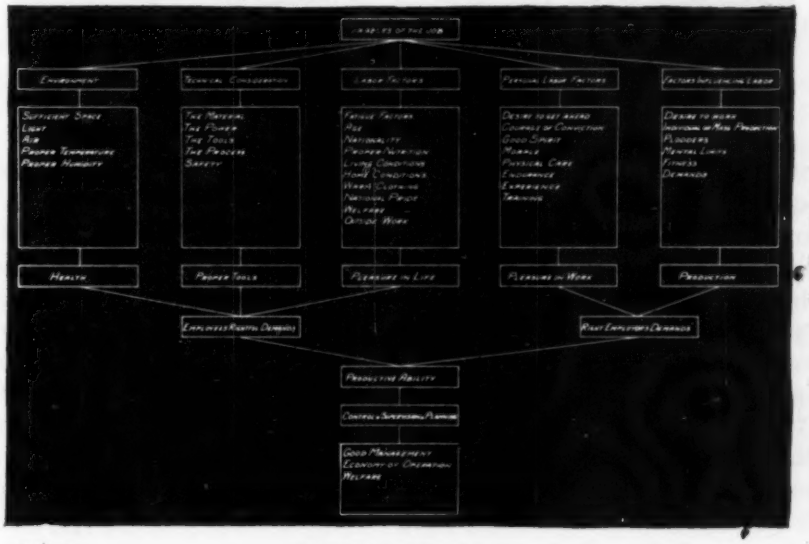
Principle No. 3—the development of a spirit of hearty coöperation—is also a lengthy subject and of no import in this discussion.

Principle No. 4—the division of the work between the management and the workers—is also not directly applicable here.

It is the first principle—the development of a science for each element of a man's work—which I am trying to tell you something about.

I will not go into the details of classifications and standardization of products, methods, materials, etc., but will endeavor to tell you about the science of manufacturing, about the centralization of individual efforts, and the connection of all parts of the shop so that the work is carried on rapidly and reliably in a large volume.

The following chart shows the variables affecting the job and the employee.

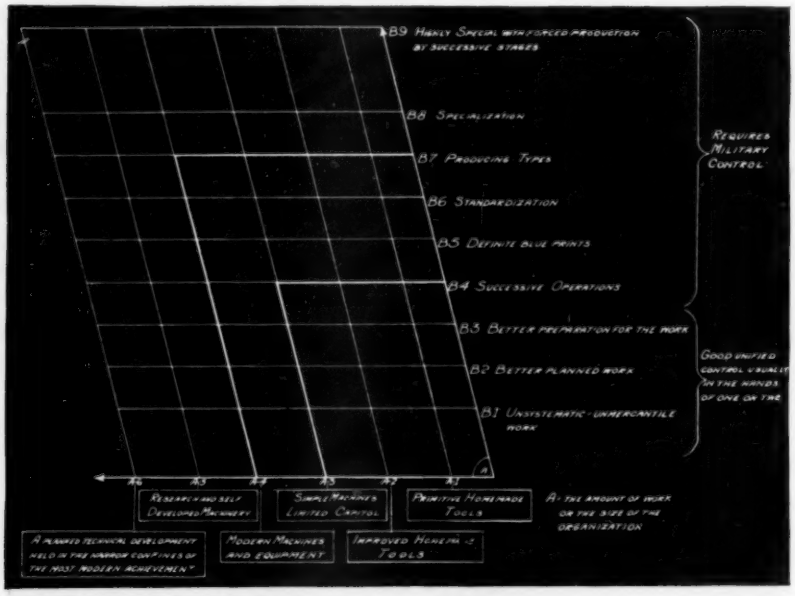


Sollheim Variables of the Job.

The other graph shows the progress in organization of a plant. It is the function of good management to simplify and improve—that is, to lower the cost of production and to make the work easier for everyone. This graph shows the various steps of organization in a growing enterprise.

Management is leadership. Effective leadership, of course, means the ability to deliver the goods. The trouble, however, is in getting men who are willing to be leaders and who will never "pass the buck." Inherently, we are all lazy. Work was forced on us. It is the invention of civilization, city living, etc. But work can be made pleasant. Some men can make it pleasant for themselves for others

it must be made pleasant, but only the men who find their work a pleasure become leaders—"passing the buck" is not known to them. Leadership is the faculty of finding happiness in one's work, and because of civilization and modern development of industry good leadership is destined to depend more and more upon


B9 Highly Special with forced production at successive stages
B8 Specialization
B7 Producing Types
B6 Standardization
B5 Definite blue prints
B4 Successive Operations
B3 Better preparation for the work
B2 Better planned work
B1 Unsystematic - unmercantile work
Requires Military Control
Good unified control usually in the hands of one or the
A
A6
A5
A4
A3
A2
A1
Research and self Developed Machinery
Simple Machines Limited Control
Primitive Homemade Tools
A = the amount of work or the size of the organization
A planned technical development held in the narrow confines of the most modern achievement
Modern Machines and Equipment
Improved Homemade Tools

Sollheim Organization of the Plant.

education and specialized training—a good management is not accidental; it is created by intelligent, broadminded leadership, founded on experience and specialized knowledge.

In *Volume Production Pharmacy* specialized knowledge is very necessary. The pharmaceutical business requires a thorough knowledge of pharmacy, chemistry, physics and engineering. The science of chemistry was evolved by pharmacists, and most famous chemists received their earliest training in a pharmacy. some processes in pharmacy are simple, but others are extremely complex.

The small pharmacy was naturally swayed by local conditions. Not only does the manufacture of chemicals require a chemical knowledge, but even the simplest pharmaceutical preparation—for uniformity in product is an essential quality. The wholesale manufacturing establishment must supply uniform, carefully controlled products.

The knowledge of physics enters largely—critical temperatures, distillation temperatures for the largest yields, shapes of apparatus for best results, so that one can produce economically—all this knowledge is necessary in *Volume Production Pharmacy;* not only necessary for a better product, but so that it may be produced economically.

Formerly, before the pharmacist was a super-salesman and before the communities were so closely populated as they are now, the pharmacist had much spare time and manufactured these products; only the ingredients were charged in the cost, not his labor. With such conditions the manufacturing pharmacist has to

compete and therefore also engineering knowledge is utilized in the construction of apparatus and machines that will lower the cost of production.

Good management, with scientific knowledge and specialized training, is very necessary. Good management eliminates waste; waste in industry is one of the most serious problems of to-day, and in the pharmaceutical business it can be extremely large. Formerly it was not possible to valuate in so many figures the waste in industry—we audit our books and know exactly in dollars and cents where we stand; we analyze our merchandise and know if it is 95% pure; we analyze labor turnover, but we have not given the same attention to mathematically calculated and audited management—this is most important. The Committee on Elimination of Waste and Industry of the American Engineering Council has formulated a valuation sheet for determining waste in industries.[1]

The question of organization is next of importance. The type of organization should be defined in order to create mutual confidence and coöperation. By having the organization and the duties of each executive defined, it relieves each one of the petty duties, it creates internal harmony and an interchange of ideas. To lay out the scope, privileges, and duties of the various officials and correlate them so that the coöperation is for the good of the firm and harmony—it is important that plans are carried out promptly.

It is even more necessary to define the duties of every employee and where possible give him a manual telling him just how he must do his work. This places the burden of planning on the management.

Again we are back where we started—applying the principles of Frederick W. Taylor to the work and making it easier for everyone.

In our plant we have solved a great many of these questions by establishing a Planning Department.[2]

In his concluding remarks Mr. Gesell said: "The system of follow-up is original with us—it is a modification of Taylor's methods. It gives each one a specific job to do, makes everyone toe the mark, gives a rigid control, and no one is inclined to 'pass the buck.' It gives a great deal of independence to the foremen of various departments, but it absolutely controls the work and avoids delays in deliveries. We have looked into many other systems in other factories, especially those in the same business, but have never yet found a simpler system with as little red tape. All of the planning, routing and control is done by two people."

LABORATORY OF
LEHN & FINK, INC., BLOOMFIELD, N. J.

MEMORIES OF 'SEVENTY-TWO.

BY THOS. D. McELHENIE.

Eighteen seventy-two to Nineteen twenty-two—quite a smart jump.

What a wealth of memories comes with these figures. For a man who has been for some months reading Wells' "Outline of History" to speak of some event

[1] While this questionnaire has great value for wholesalers and manufacturers, it has not sufficient general interest for reprinting.—EDITOR.

[2] The speaker described in detail the manner of handling orders for preparations, so that complete checks are kept throughout the transactions.

as occurring fifty years ago seems like a joke. That book starts off with periods of one hundred to five hundred millions of years ago.

Early in the year 1872 there emerged to the gaze of an admiring world from the doors of old P. C. P. an eager active set of 59 young fellows of whom Professor Parrish said one day, after quiz—"A pretty nice bunch of boys," the writer being one. They soon dispersed to their home towns. For myself, after a few weeks' work in the old Hodgson store where I had been as a junior, I traveled back to God's Country not far from this beautiful city and soon found employment in charge of the laboratory of the wholesale house—Benton Meyers and Canfield in this city.

The day the Association's meeting opened, September 3, 1872, William McIntyre of Philadelphia looked me up on his arrival and put me on his list as a delegate of the Alumni. So I had the privilege of the sessions, being also nominally in charge of the firm's exhibit. I was soon in touch with Remington and we became quite chummy. He was at that time in the employ of Powers and Weightman and had charge of a fine exhibit of chemicals.

During that meeting telegrams came announcing the passing of Prof. Edward Parrish at Fort Sill and of Dr. Henry T. Kiersted in New York, both ex-presidents of this Association. The volume for 1872 of the Proceedings of this learned body is illuminated by the words of wisdom and the proofs of skill of the foremost men of American Pharmacy of their time. Not to speak invidiously let me mention a few alphabetically—P. W. Bedford, Henry Canning, C. Lewis Diehl, Albert E. Ebert, R. W. Gardner, John F. Hancock, J. L. Lemberger, John McKesson, Jr., Thomas F. Main, John M. Maisch, George F. H. Markoe, William Procter, Jr., Joseph P. Remington, William Saunders, Emil Scheffer, James T. Shinn, E. R. Squibb. As time has gone on it has proved to me more and more strongly that it was a great thing for a young fellow not yet 23 years of age to make the acquaintance of some of those men and to meet them in later years again and again, and now and then to have a letter beginning "My dear McElhenie."

In the autumn of 1872 here in Cleveland came the great rush for asafoetida as the remedy for the prevailing epizootic; Mr. Myers will remember this, I think, as he was bossing the job. We were ordering cases of it by telegraph from New York to come by express and sending it in parcels by express to our trade to save the horses of Ohio.

The new percolator devised by Dr. E. R. Squibb was shown first at the meeting in 1872. The volume of Proceedings for 1872 from which I have culled some notes was kindly loaned me by the Brooklyn College of Pharmacy—it was one of a number donated by Edward L. Milhau to the Brooklyn College.

Now to digress a little let me lay out some work for future writers of "Memories." A short argument as to the times and places for future meetings. The American Pharmaceutical Association having reached "Pier 70" can quite often select a meeting place where its conventions have not been held for 50 years, so that semi-contennial celebrations will be quite frequent. For example, in 1873 the meeting was at Richmond, but has been held there twice since; therefore, 1923 may be called an open date for the committee. In 1874 the meeting was at Louisville and has not been held there since, so that settles the place for 1924; in 1875 at Boston and in 1876 at Philadelphia and both cities have been visited

since more than once, so that 1925 and 1926 may also be called open dates. In 1877 we were in Toronto and not since, so our Canadian comrades will surely have the latch-string out in 1927; and the same may be said of 1928, for Atlanta; 1930, Saratoga; 1932, Niagara Falls; 1934, Milwaukee; 1935, Pittsburgh; 1936, Providence; 1937, Cincinnati; 1938, Detroit; 1939, San Francisco; 1940, Old Pt. Comfort; 1942, Profile House, and so on to Cleveland in 1972.

PLACES OF MEETINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY THEODORE J. BRADLEY.*

In 1921, the writer discussed the selection of places for meetings of the Association, in a brief paper published in the JOURNAL for July 1921 page 497. The principles laid down in that paper have apparently received general approval and the present paper is intended to aid in the selection of meeting places for the next few years.

In the previous paper, it was stated that the meeting places should be selected in such a way as to visit different sections of the country frequently, but the concentration of population and membership in the northeast makes it advisable to meet in this section more often than in other sections.

The places of meetings for sixteen years have been as follows:

1908	Hot Springs, Arkansas.	1912	Denver, Colorado.	1916	Atlantic City, New Jersey.	1920	Washington, D. C.
1909	Los Angeles, California.	1913	Nashville, Tennessee.	1917	Indianapolis, Indiana.	1921	New Orleans, Louisiana.
1910	Richmond, Virginia.	1914	Detroit, Michigan.	1918	Chicago, Illinois.	1922	Cleveland, Ohio.
1911	Boston, Mass.	1915	San Francisco, California.	1919	New York City, New York.	1923	Asheville, N. C.

Meetings of the American Pharmaceutical Association, 1908–1923.

* Chairman of the Committee on Time and Place of Meeting.

These are shown graphically on the accompanying outline map. The Committee on Time and Place of Meeting endeavors to follow a logical plan in the selection of sections of the country for the meetings, but the Committee does not designate particular cities in which the meetings should be held, in advance. After acceptable invitations are received, a recommendation of the place of meeting for the following year is made to the Association by the Committee.

BOSTON, MASSACHUSETTS,
MARCH 1, 1923.

REORGANIZATION OR FEDERATION.

BY A. R. L. DOHME.

As president of the American Pharmaceutical Association at its annual meeting in August 1918 at Chicago I made a strong effort to bring about a federation of pharmaceutical activities in this country. The American Medical Association represents American medicine both potentially and actually because it has enrolled as members three-fourths of the physicians of the country. Whether this is a sign of strength or weakness in the form in which the A. M. A. is directed is an open question—but that it is a tower of strength when it comes to accomplishing results legislatively and protecting the interests of the individual physician legally is beyond dispute. This is not possible for pharmacy because it has at least seven national associations, most of which have a paid secretary and legal expert to protect its members' interests and unfortunately these paid people in order to make a proper showing individually and justify their pay and position usually prefer to shine individually than succeed collectively. Hence, in my opinion, reorganization alone will not produce coöperation and without coöperation there cannot be success. While reorganization is better than present organization, it can only very gradually accomplish what we are after primarily and that is united coöperation for a single end and purpose.

The National Association of Retail Druggists may wish the American Pharmaceutical Association well and trust it will succeed in its aims and purposes which are high and look to maintaining the science and the profession of pharmacy at its high level. The National Association of Retail Druggists regards pharmacy as a business and correctly so and feels that its mission is to increase the earning power of its members. A man in business is in business to make money and make as much of it as he can in the legitimate carrying on of that business and this prime feature of the pharmacist the A. Ph. A. has never recognized and in consequence it has never been a success as to membership and interests of the retail pharmacist. The meetings of the A. Ph. A. have from time immemorial been attended principally by the teachers of pharmacy and the allied interests catering to pharmacy and seeking to secure business from the pharmacist. The main work, interest and discussion at A. Ph. A. meetings are by the teaching and manufacturing interests. The main purpose in attending an A. Ph. A. meeting has always been meeting friends and hearing others read papers and convey knowledge. If you attend a N. A. R. D. meeting you will find principally retailers and observe that these retailers dominate the proceedings, do the work and accomplish the results which are almost entirely of a practical and financial nature.

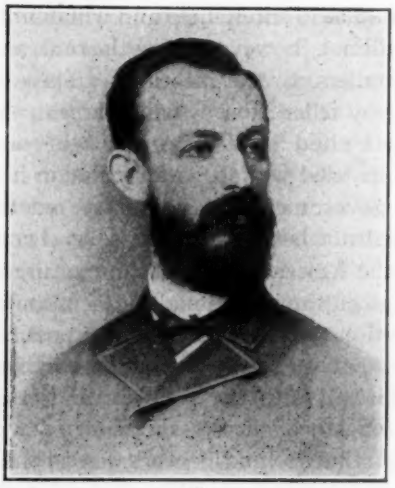
You will find the same thing applies to local branch meetings as a rule as compared to local retailers' association meetings. Retail pharmacy to-day through the deplorable chain store development has become largely a merchandising business and the most successful retailers are usually the most successful merchandisers. But where the N. A. R. D. falls down is that it fails to recognize that the chief asset of the pharmacist is his professional standing and the feeling the general public and the physician hold regarding him. They prefer to buy allied lines from the pharmacist because of his scientific training which enables him to use better judgment in buying better goods and in knowing better how to keep them in proper shape. If this professional side is neglected largely or entirely at the expense of merchandising ability, the pharmacist loses his main asset and in consequence becomes a competitor with the confectioner and corner grocer or general store owner. Therefore it is essential that for maintaining his chief asset, that of being a scientific professional man with a college training and which places the physician so high in the minds of the public, the scientific and research side of his profession must be maintained. This the N. A. R. D. does not do but looks to the A. Ph. A. to do and the A. Ph. A. does do it. In other words the two associations dovetail wonderfully but being separate entities do not coöperate and hence fail to produce the needed result of stamping indelibly upon pharmacy the hallmark of a scientific profession that demands and should receive the respect of the public and its support. Most retailers attend the N. A. R. D. and not the A. Ph. A. and the chief asset of a pharmacist if he is to survive professionally is dispensed at the A. Ph. A. which retailers do not attend as a rule. Unless I am greatly mistaken, the yardstick to measure pharmacy and pharmacists will in future become in increasing degree his professional as against his merchandising standing and the store which depends upon its merchandising standing will lose out against the pure merchandiser without the scientific training.

Whether the reorganization plan proposed at the Cleveland meeting and which gives more power to the House of Delegates and thereby to the State Associations will produce the desired result is an open question; it will surely help and will doubtless increase the interest of the members. It will not, however, bring the rank and file of the retailers, especially the successful retailers, to the meetings. There is only one way to do this successfully and that is by federation by which I mean the formation of a United Drug Association like the United States of America as compared to the several states. United we stand, divided we fall, is an axiom in history. It applies as well to pharmacy as to our government. My effort at federation failed for two reasons—first, because it had not been sold to its several constituent parts in advance, and second, because the American Drug Manufacturers' Association, National Wholesale Druggists' Association, National Association of Retail Druggists and The Proprietary Association felt that it meant a possible domination of their interests by retailers because these so far outnumbered them severally and collectively. Other elements entered into the problem and were clearly observed by me at the time. The paid officials of these associations, where they had any, felt that their positions and their influence and hence value to their associations would be put in jeopardy by such federation. As they were in most cases the mouthpiece of their associations at meetings of their own and of other associations, their views carried. Trade jealousy also entered and it was con-

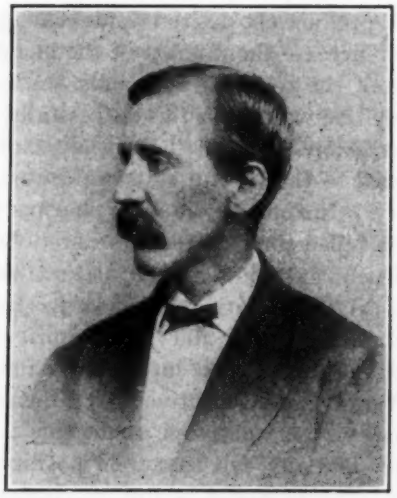
sidered bad business to let me get any credit for a progressive move. These objections, however, were not valid, for the underlying scheme was to have these associations retain their name, officers and unhampered control of their meetings and actions as theretofore except that in legislative matters there was to be a joint meeting (which would replace the present National Drug Trade Conference) of which all the several associations should be represented and united action sought. This would have a great advantage over the National Drug Trade Conference as definite action could be secured since all the associations would be in active session whereas the Conference can never take a definite action but must refer all action back to its constituent associations, which means that united action practically never occurs, only discussion. The manifest advantages would be that all branches of the trade would meet together and thus save the expense of attending several meetings; they would have a chance to meet all branches of the trade and when legislation was considered they would have the opportunity of coöperating and acting together on such matters as concerned all and needed united action.

As to the proposed plan of reorganization it marks a step in advance of existing conditions and as such is distinctly desirable and to be recommended. The hope and the expectation is that gradually through this plan the idea of federation will be more thoroughly discussed and better understood.

The real ultimate goal, however, should be to have a central home for pharmacy in a permanent building belonging to all branches of the profession and then to federate or consolidate all the separate associations under their own names as sections of a single centralized national association naturally called the American Pharmaceutical Association, both because of its name, its long and useful history and its high standing and ideals, all assets that are valuable and not easily and successfully attained.



EX-PRESIDENT E. L. PATCH.
About the time when he presided at the former Asheville meeting of the A. Ph A.



EX-PRESIDENT JOHN F. HANCOCK.
About the time when he presided as President of the A. Ph. A., 50 years ago.

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

[EDITOR'S NOTE.—Late in February of the present year the Chairman of the Executive Committee sent a letter to the deans of the schools holding Conference membership and to a few other prominent educators not holding this executive position. The contents of the letter is covered by the following statements and request:

An individual can make but little progress unless he has a well-thought-out program which he attempts in the main to follow. The same is true of an organization. Now that the Conference has gone to a four-year high school requirement for entrance and has definitely agreed upon dropping the two-year course beginning with 1925, I am raising the question as to what you think is the next most important step or steps for the Conference to take in its educational program. Will you not give me the results of your thought in a clear-cut statement? This statement with those of the other men will be published in the Conference section of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION at an early date. This will enable every man to know what the other men are thinking and it will be very helpful to the Executive Committee in formulating the program for the Asheville meeting in September.

The replies received to date are presented in this issue. The Chairman hopes that every one will take this opportunity to present his views and contribute to a constructive program.

RUFUS A. LYMAN, *Chairman and Conference Editor.*]

CHARLES H. LAWALL OF PENNSYLVANIA: The next definite step which should be taken by the Conference schools, following the inauguration in 1925 of the three-year minimum course for a pharmaceutical degree, which was agreed upon at the Washington meeting in 1920, is the establishment of full time courses in which the work is spread over a minimum of five days a week.

This change should go into effect by 1926 or 1927, if possible, following the established custom of giving adequate time for the change to be made. This will not necessarily prevent the student without means from earning his way through college if he desires to take a partial course and attend a longer time to complete his credits and obtain his diploma.

There are other improvements that can be carried on simultaneously, but the foregoing, in my opinion, is the most important.

W. F. RUDD OF VIRGINIA: Replying to your inquiry as to what should be the next step in Conference work, now that the four-year high school requirement goes into effect in 1923, and the three-year course in 1925, I am convinced that immediately we must undertake two more reforms which are sadly needed, especially in some of the larger schools in the East.

In the first place the three day a week curriculum is now nothing less than an anachronism.

In my judgment this system is indefensible, and the Conference should go on record at the 1923 meeting withdrawing membership from any school that has not arranged its curriculum on the full weekly basis by September 1924.

Another problem of outstanding importance is the rapid increase in the number of students entering pharmacy schools.

It would seem that the real needs of the public should largely determine the number of men that should be educated as pharmacists. At the present time, many of our institutions are matriculating numbers far in excess of what may be safely absorbed by the legitimate pharmaceutical needs. Is it not the plain duty of the Conference to tackle the problem of what effect this is going to have on the whole question of pharmaceutical welfare? It seems to me the time has come when our Organization must stand squarely for policies that will give the public a chance to have a type of pharmaceutical service comparable with other professional service.

If schools of pharmacy are willing to stretch their capacity to the breaking point, giving no consideration to the real needs, what hope is there for the future of pharmacy?

C. B. JORDAN OF INDIANA: The American Conference of Pharmaceutical Faculties has for years had a minimum requirement for a year's work that is altogether too low, far lower than the minimum requirement in any other line of college activities that I know of. I believe the time has come when pharmacy must demand a training comparable to the dignity of the profession; therefore, I believe that our next step is to raise the minimum requirement in hours for

a year's work. I believe our minimum requirement for a year's work should be not less than 1000 hours, distributed judicially between lecture and laboratory work.

T. J. BRADLEY OF MASSACHUSETTS: A good general, after making progress in a campaign, stops from time to time to securely "consolidate" his position before he proceeds further, to insure his army against the danger of loss of such advantage as has been gained. I think the Conference is in an exactly similar situation in the matter of entrance requirements and length of course and that it will be a mistake to try for any further advance along these lines at this time.

It is my feeling that we shall have enough of a program for this year if we take care of routine matters and do any effective work on the project of the classification of pharmacy schools. This is already on the program and it is an important and delicate subject.

W. B. DAY OF ILLINOIS: I think the Conference is to be congratulated upon the progress that has been made of recent years in the requirements for admission to schools of pharmacy. I doubt whether we can raise these admission requirements further in the immediate future, though I look forward to one year of college requirement as the next step when the schools have lengthened their courses to three years. I think we should then put a more definite valuation upon each year's work both as to the number of hours of instruction and the nature of the work, the distribution of lecture and recitation and laboratory courses, etc.

H. M. FASER OF MISSISSIPPI: In answer to yours relative to the next important step to be taken by the Conference, I would say—standardization of the schools.

L. E. SAYRE OF KANSAS: I am inclined to think that we should boost the educational requirements *as soon as practical* to at least one year of university work. I find that our high-school graduates *to-day* are lower in their scholarship than they were ten years ago. That is my impression. I may be wrong and my observation may be faulty but I am inclined to think that many of our students ten or fifteen years ago who were of the two-year high-school grade or even the eighth grade were equal to some of the present-day high-school graduate caliber we are now receiving. I am also inclined to the opinion that in accepting students from high schools we should see to it that they have as preparation a certain amount of mathematics, Latin, physics, and possibly chemistry, but if they do not have any chemistry they should be obliged to take an elementary course, if it is offered, at the university.

I am quite sure I shall find many who differ with me and who are quite as competent to judge as I am. I realize that I cannot speak for all sections of the country. Different sections have, perhaps, different material to start with and different machinery for preparation for professional training. I should be glad to hear what other members of the Conference have to say and I know I shall profit thereby. As a final word I wish to say, I think that our pharmacy schools might be making a mistake if we make it impossible for a bright fellow (capable of training, with good hereditary intelligent endowments and potential ability) to enter the pharmacy course even if he be only a two-year high-school man; I am not sure that the high-school sifting process (while perhaps it is the best we have thus far acquired) is quite perfect. It is a question whether we should insist unconditionally on a three-year course in 1925. If the high school prepares the student *properly* then he could accomplish the pharmacy course in two years, especially if the State Board requires two years of practical experience before registration, but if the high school fails to properly train them the three-year course should be made obligatory.

F. J. WULLING OF MINNESOTA: 1. In answer to your question what the next upward steps should be, let me say that, according to my judgment, nothing is more important at the present time than the necessity of a more careful selection of those who are admitted to our ranks. The within papers entitled, "Eliminate the Unfit at the Source" and "Should Students Be Selected?" cover the point.

2. The colleges should now strive to make their minimum course one of at least three full college years. We have already done so and are so crowded (one hundred thirty-nine in a building intended for eighty) that we are seriously thinking of making our minimum course the four-year course.

3. We are also working on a university academic year beyond the high school before entrance upon pharmaceutical work. We have this matter fairly well under way and I firmly believe that before very long this college can again point the way in the respect mentioned. For further elucidation along these lines, I enclose a copy of a paper entitled "An All-University Freshman Year" which I hope will interest you.

H. C. WASHBURN OF COLORADO: I think two problems stand out rather clearly:

(*a*) to eliminate the three-day-a-week course, and

(*b*) to go to the conventional length of college year.

Both of these are important, probably in the order named; I doubt if a teacher or a pupil can maintain a sustained interest in as broken a schedule as three days a week.

As to entrance requirements, I believe that graduation from a four-year high school should suffice for many years to come. I also believe that a three-year course predicated upon high-school graduation should serve the purpose for some time, although there will be schools that will voluntarily go to a four-year requirement as soon as all the others have advanced to three.

I do not believe that any attempt should be made at standardizing teachers; that is a matter that would be exceedingly difficult to accomplish, and it is a matter that will gradually adjust itself.

E. F. KELLY OF MARYLAND: I heartily agree with your statement that the American Conference of Pharmaceutical Faculties has made real progress during its history, although this progress may not measure up to the ideals of all of its members. It would, however, be comparatively easy to call attention to many more or less important duties which should now be undertaken. Among others, two seem to me to be of the greatest importance, because they are fundamental to the further progress that the Conference can make.

The first is to secure, either by its own effort, or from some other source, a method which will show whether or not the standards so far adopted by the Conference are actually being carried out by its members, in order to give the Conference the assurance that what it has accomplished is of full value. I favor the Conference undertaking this work itself, rather than to await the convenience of some other agency, but believe that the work should be done in close coöperation with the National Association of Boards of Pharmacy and with the American Pharmaceutical Association.

The second duty is to take such action as is necessary to bring the course in pharmacy, now that the question of entrance requirement is settled, into proper accord with the generally accepted educational ideals. To discuss the necessary changes in detail in such a short statement as you wish would be impossible, even for those who have given collegiate education the proper study. Bring the course in pharmacy to such a point that it will be considered as of full educational value so as to meet the criticism that the course in pharmacy, however good it is, is too highly technical and does not afford the broad general education that the other scientific and professional courses do. This undertaking should not be delayed until the minimum course is four years.

The Conference, judging from its past performances, can solve these fundamental problems, and I hope to see them undertaken promptly and earnestly.

JACOB DINER OF NEW YORK: The most important thing the Conference can do now is to concentrate on the State Legislation with a view of making graduation from a college of pharmacy a prerequisite for admission to the Licensing Examination similar to the law now in force in New York State.

CHARLES E. MOLLETT OF MONTANA: As to the Conference I think the next thing in order is the standardization of the three- and four-year courses and their respective degrees.

ZADA M. COOPER OF IOWA: The American Conference of Pharmaceutical Faculties should make its next goal a full week of not less than five days for all of its member colleges. We have left behind the twenty-five-week year, we are pledged to a four-year high school entrance requirement and a minimum course of three years. The elimination of a three-day week is the next logical step in advance.

No matter how able the instructional staff, how ample the laboratory and library facilities, no student can get the maximum good out of his course with only half of each week devoted to school work. No matter how great the concentration, assuming that it can be crowded into three days, and the student be free to work the other three, when does he study, when does he find time for a part in other college activities that are not an unimportant part of his education if he is to go out a capable pharmacist and a well-rounded citizen? When one looks at the schedule of classes of institutions running thirty-six weeks in a year with thirty or more clock hours weekly, one wonders how it is possible to crowd fundamentals into three days. Let us have not less than five school days each week.

For some time the Conference has recognized the importance of an investigation by some outside agency like the Carnegie Foundation. Such an investigation would go far toward standardizing courses and degrees. Since there is no hope of such an investigation being made in the immediate future, any other means of accomplishing any of the same results should be encouraged. The National Association of Boards of Pharmacy has a committee at work on a plan for a classification of colleges. The Conference ought to lend its support to such an undertaking. It is obvious that such a classification would be of enormous value to the N. A. B. P. in administration of reciprocity regulations and to various boards in their administration of prerequisite laws. It is almost as obvious that it will be equally good for the colleges in a different way.

There are other tasks of importance, there always will be work ahead if we are to keep pace with progress, but we advance most rapidly when we put our efforts into a few things at a time. A full week seems the most important step just now and encouragement to the Boards in their classification of colleges.

EDWARD H. KRAUS OF MICHIGAN: Our group is unanimously of the opinion that the Conference has probably gone far enough for the present with legislation regarding admission requirements and with respect to the minimum college course. Inasmuch as these requirements are not yet effective it is thought highly desirable to wait until several years have passed after both of them have been in operation before an attempt is made to increase the length of the minimum college course. It appears to us to be much more desirable that a comprehensive and searching survey of the colleges of pharmacy of the country be undertaken at as early a date as possible, and since the Carnegie Foundation for the advancement of teaching will, in the very near future, have completed its survey of the colleges of dentistry, it probably would be well to again urge the Foundation to undertake a similar survey for pharmacy. As I understand it, the Foundation has on several occasions been requested to undertake such a survey but on account of projects already under way was unable to report favorably upon the request. In discussing the matter recently with a representative of the Foundation I was led to believe that conditions have changed somewhat more sympathetically than in the past. At any rate, I would suggest that if a special committee has been appointed on this question it should, by all means, take up the matter again.

C. W. JOHNSON OF WASHINGTON: Granting that the four-year high-school requirement will be met and that the three-year course is settled and all Conference colleges will obey the regulations the next step in line of advancement should be to raise the number of clock hours for graduation and to make the college year one of 36 weeks. I believe it would be fair to require a minimum of 900 clock hours per year or it might be stated as a minimum of 2700 clock hours required for graduation. This would require the colleges to run somewhere near full time for five days per week.

H. H. RUSBY OF NEW YORK: Inasmuch as the membership of the Conference consists of faculties and not of individuals, I submitted your circular letter of February 8 to our faculty, at a meeting held yesterday, and was unanimously instructed to submit the following reply.

It seems to us most important that the Conference should clarify the situation as to the authority of its rules as binding its member-schools, and as to the authority of its committees and officers to commit the Conference to such of their respective acts and opinions as have not yet been acted upon by the Conference itself.

All the schools of the Conference entered into a definite agreement to require high-school graduation after January 1, 1923, but this agreement seems to be a dead letter. If so, what is the use of agreeing to drop the two-year course after a certain date? We are not expressing the opinion at this time and place that such rules should be forcibly applied, but we think there should be some definite understanding on this subject. In the case of the high-school requirement, there was not merely a rule, adopted by a majority, with a dissenting minority, but a unanimous agreement, which has now been violated by the very schools that proposed it. This inevitably raises a question as to the force of any Conference agreement.

So far as we can learn, the Conference has not "definitely decided" to drop the two-year course in 1925. We all recall that there was a resolution that expressed the opinion that this would be desirable. None of us recalls any subsequent action. While I was in Minneapolis, Chicago and Ann Arbor last week, I made diligent inquiry regarding this, and could find no one

who knew of such definite action as you report. What appears to have happened is that an erroneous entry has been made in the Proceedings.

It seems to many of us that there is a disposition on the part of officers and committees, assuming—either with or without sufficient grounds—that their views represent the majority, to proceed on the basis that they may commit the Conference in advance of its action.

It also seems as though the aims and objects of the Conference should be frankly and impartially discussed. There is a growing feeling in the minds of many that the differences of view in regard to this subject between two groups of our schools may prove to be irreconcilable. The schools of this section are obliged to concern themselves with the great body of practicing pharmacists, and there is reaction as well as action. If we run away from the pharmacists, even if it be in an advanced direction, we end our usefulness. We must either carry the body along with us or give up, and we cannot carry the body very rapidly. It seems that some of the western schools dodge this problem, and give their whole attention to themselves and their students, and thus fail in one of their most important duties. Certainly, we should not dictate any other course to them, but it may be accepted as an irrevocable decision on our part that we will never imitate them in this direction. You must accept it as a fact that, with few exceptions, we are unselfishly devoted to our work, and are trying in the light of long experience to adopt that policy that will work out best in the long run. It is not to be expected that we will submit to misinterpretation and to martinet methods, a large part of which have no better basis than provincialism. Granting that both parties are sincere and earnest, the question arises whether it is possible to maintain a working arrangement by which different methods can and may be pursued. Perhaps not! It may be that the conditions are so different that two organizations could work more harmoniously and efficiently than one. There should be a more determined effort than has yet been made to determine this vital question.

We are at the present time endeavoring, through legislation, to restrict the opening of improper drug stores in this State. This will curtail the requirement for clerks, but even with this curtailment, the demand cannot be met. Even our daily papers teem with "want ads" for drug clerks. What would our State Association do to our entire program of progress if we were to take a step that would put a serious check on the supply of clerks?

The whole point that I am trying to make is that it will not do for the Conference to disregard the conditions and necessities that beset a seeming or technical minority.

The discussion of these matters must not be conducted in an intemperate and offensive manner. Decision and firmness do not require this. While this is a minor consideration, it is still true that such methods do not make for judicial decisions.

So far as we are concerned, you will have our firm and steady support in every effort to secure the best results, but we can never consent to be coerced into a course that will frustrate the comprehensive plans for betterment on which we are working. If the conditions absolutely demand a separation, let it be a separation by agreement, which will not tend to lessen the power and influence of either side in working out its particular problems.

HOSPITALS OF PAST CENTURIES.

In a recent issue of the Philadelphia *Public Ledger*, George Nox McCain discusses hospitals of ancient and modern times, from which the following abstracts are made:

The establishments for the sick of the early Jewish period were known as Beth Holem (houses for the sick). Beth Saida, famous in the New Testament scriptures, was supported by charitable (Saida) subscriptions. "Mostly, these hospitals were located near a pool or stream of running water. Many of these pools were supposed to be beneficial in cases of gout and rheumatism. There were attendants who helped the ailing and infirm into the water."

The Egyptians received medical attention in their homes, the poor in the temples. Ancient Greece supported houses for the treatment of the sick. A tablet unearthed near Pacenza, Italy, evidenced that Romans had hospitals and the one referred to on this tablet was endowed. Near Zurich, Switzerland, a Roman military hospital of the time of the Emperor Hadrian was discovered and excavated. "It contained fourteen rooms and was remarkably well outfitted for that day. It was supplied with many kinds of pharmaceutical and surgical apparatus, probes, pincers and tubes. Among other instruments found were medicine spoons in bone and silver measuring vessels and pots for salves and ointments."

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Ztschr. anal. Chem., 62 (1923), 97; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 88

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Estimation of bismuth
Chem.-Ztg., 47 (1923), 22; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 93

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Rev. trav. chim. Pays-Bas, 42 (1923), 199; through *Chem. Zentralbl.*, 94 (March 28, 1923), part 2, 706

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Ztschr. anal. Chem., 62 (1923), 23; through *J. Chem. Soc.*, 124 (Feb. 1923), part 2, 92

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Detection of chlorates
Anal. fis. quim., 20 (1922), 662; through *J. Soc. Chem. Ind.*, 42 (March 16, 1923), 222A

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Gazz. chim. ital., 52 (1922), II, 323; through *J. Soc. Chem. Ind.*, 42 (March 23, 1923), 248A

Tubandt, C., and Weisz, Harry
Gasometric method for the estimation of carbon dioxide in carbonates
Chem.-Ztg., 46 (1922), 1105; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 87

Wendt, Gerald L., and Clarke, Alfred H.
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J. Am. Chem. Soc., 45 (April 1923), 881

Willard, H. H., and Fenwick, Florence
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J. Am. Chem. Soc., 45 (April 1923), 928

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J. Am. Chem. Soc., 45 (April 1923), 933

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Ztschr. angew. Chem., 35 (1922), 715; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 90

INORGANIC CHEMICALS.

Anon.
The boric acid and borax industry
Am. Drug., 71 (April 1923), 26

Burkardt, H.
Analysis of sodium perborate
Chem.-Ztg., No. 1 (1923); through *Pharm. Ztg.*, 68 (April 4, 1923), 268

Debussy, M.
Bromine industry of Germany
Chim. et Ind., 9 (Feb. 1923), 245

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Ztschr. anal. Chem., 62 (1923), 137; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 86

Matthes, H., and Schütz, P.
Assay of potassium iodide
Pharm. Ztg., 68 (March 31, 1923), 256

Merriman, R. W.
Estimation of sodium hydrosulphite
J. Soc. Chem. Ind., 42 (March 23, 1923), 290

Price, T. Slater
Some properties of mercuric iodide
J. Soc. Chem. Ind., 42 (March 23, 1923), 292

Stracker, W., and Kannapel, E.
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Ztschr. anal. Chem. (1922), 378; through *Pharm. Ztg.*, 68 (April 4, 1923), 268

Teeple, John E.
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Ind. Eng. Chem., 15 (April 1923), 419

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Bull. soc. chim., 31 (1922), 1176; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 91

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Gravimetric estimation of formic acid
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Bates, Henry H., Mullaly, John M., and Hartley, Harold
Estimation of acetone in methyl alcohol
J. Chem. Soc. Lond., 123 (Feb. 1923), 401

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Preparation of peptone
Pharm. Monatsh., No. 2 (1923); through *Chem. & Drug.*, 98 (March 31, 1923), 432

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Improved method for the determination of alpha-, beta-, and gamma-cellulose
Ind. & Eng. Chem., 15 (April 1923), 377

Bray, G. T., and Major, F.
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J. Soc. Chem. Ind., 42 (March 16, 1923), 106T

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J. Biol. Chem., 54 (1922), 617; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 94

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Preparation of sodium oxalate from the formate
Giorn. chim. ind. appl., 5 (1923), 3; through *J. Soc. Chem. Ind.*, 42 (March 23, 1923), 243A

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Electrometric titration of reducing sugars
J. Am. Chem. Soc., 45 (April 1923), 1043

Evans, M. W.
Volumetric determination of sodium salicylate
J. Am. Pharm. Assoc., 12 (March 1923), 225

Gesell, Wm. H.
Acetylsalicylic acid
J. Am. Pharm. Assoc., 12 (March 1923), 228

Henningsen, Carleton
Determination of various monohydric phenols by the phenol reagent of Folin and Denis
Ind. & Eng. Chem., 15 (April 1923), 406

Hoffmann, Walter F., and Gortner, Rosa A.
Determination of organic compounds
J. Am. Chem. Soc., 45 (April 1923), 1033

Hotz
Detection of benzol in benzine
Schweiz. Apoth.-Ztg., 61 (Jan. 11, 1923), 13

Jalade, E.
Natural and artificial coloring matters
Bull. sci. pharmacol., 30 (March 1923), 143

Kling, André
Estimation of tartaric acid
Ann. chim., 18 (1922), 189; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 97

Kolthoff, I. M.
Iodometric determination of aldoses
Pharm. Weekbl., 60 (April 7, 1923), 362

Lévêque, André
Reactions and assay of bismuth subgallate
Bull. sci. pharmacol., 30 (March 1923), 133

Marchiolo, G.
Determination of cantharidin
Boll. chim. farm., No. 3 (1923); through *Chem. & Drug.*, 98 (March 31, 1923), 435

Martindale
Solubility of emetine bismuth iodide
Lancet, 1 (1923), 158; through *Chem. & Drug.*, 98 (March 31, 1923), 435

Moreau and Isnard
Emetine bismuth iodide
Bull. sci. pharmacol., 30 (March 1923), 129

Parri, Walter
Destruction of organic matter in the Kjeldahl method
Giorn. farm. chim., 71 (Dec. 1922), 253

Piccard, J.
Detection of oxygen in organic compounds
Helv. Chim. Acta, 5 (1923), 243; through *Südd. Apoth.-Ztg.*, 63 (Jan. 26, 1923), 21

Phillips, Sydney B.
Determination of the purity of vanillin
Pharm. J., 110 (Nov. 17, 1923), 248

Raiziss, Geo. W.
Development of the American arsphenamine industry
Ind. & Eng. Chem., 15 (April 1923), 413

Russell, H. B., and Brett, P. C.
Liquid paraffin
Lancet (March 24, 1923), 594; through *Pharm. J.*, 110 (April 7, 1923), 324

Scelba, S.
Preparation of benzyl benzoate
Boll. chim. farm., No. 2 (1923); through *Chem. & Drug.*, 98 (March 31, 1923), 438

Siegfried, K.
Dimethylaminoantipyrine
Schweiz. Apoth.-Ztg., 61 (Jan. 25, 1923), 37

Stevens, G. E.
Detection of sugar in condensed waters by means of cresol
Ind. & Eng. Chem., 15 (April 1923), 363

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Microchemical detection of fumaric acid
Pharm. Weekbl., 58 (1922), 1312; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 97

Van Urk, H. W.
Estimation of methyl alcohol in ethyl alcohol
Pharm. Weekbl., 60 (March 10, 1923), 273

Weiss, John M., and Downs, Chas. R.
Maleic, fumaric and malic acids
J. Am. Chem. Soc., 45 (April 1923), 1003

Wheeler, T. Sherlock, and Blair, E. W.
Oxidation of hydrocarbons, with special reference to the production of formaldehyde
J. Soc. Chem. Ind., 42 (March 16, 1923), 87T

Whitmore, Frank C.
Recent development in the chemistry of organic mercury compounds
Ind. & Eng. Chem., 15 (April 1923), 417

CLINICAL AND DIAGNOSTICAL METHODS.

Benedict, Ethel M., and Harrop, G. A.
Estimation of formic acid in the urine
J. Biol. Chem., 54 (1922), 443; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 96

DeToni, Giovanni
Estimation of calcium in the blood
Arch. Farm. Sperim., 34 (1922), 124, 129 145; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 87

Favrel, G.
Detection of acetoacetic acid in diabetic urine
Ann. chim. analyt., 4 (1922), 336; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 97

Ganassini, Domenico
Rapid estimation of bismuth in urine
Boll. chim. farm., 61 (1922), 705; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 93

Gerard, P., and Moisonnier, S.
Determination of urotropin in urine
Compt. rend. soc. biol., 87 (1922), 1073; through *Bull. sci. pharmacol.*, 30 (March 1923), 189

Greenwald, Isidor, and Lewman, Gertrude
Estimation of titratable alkali of the blood
J. Biol. Chem., 54 (1922), 263; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 87

Hotz
Methods for determining nitrogenous substances in urine
Schweiz. Apoth.-Ztg., 61 (Feb. 15, 1923), 77; (Feb. 22, 1923), 95

Rodillon, Georges
Detection of urobilin in blood and in the cerebrospinal fluid
Bull. soc. chim. biol., 4 (1922), 474; through *J. Chem. Soc. Lond.*, 124 (Feb. 1923), part 2, 100

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 11.
(ABSTRACT.)

WASHINGTON, D. C., April 24, 1923.

To the Members of the Council:

59. *Applicants Nos. 200–273 elected to active membership.*

60. (*Motion No. 20.*) *Motion to appropriate $150 to purchase a mimeograph for the Secretary of the Council.* Up to two months ago, the Secretary of the Council had made use of the mimeograph at the Hygienic Laboratory for getting out the Council letters and memoranda. This was made possible by allowing the Laboratory to use an old mimeograph purchased for Mr. Wilbert by the Association some 20 years ago. This mimeograph has completely broken down and is in such poor shape that the company will not even allow us anything for it in a trade. The Laboratory machine is now being used for other purposes and is no longer available. To have this work done on the outside will cost the Association about $190 in addition to the cost of cutting stencils and of supplies, so that a machine costing $150 (The A. B. Dick Mimeograph, which it is proposed to purchase) will pay for itself in less than a year. The Association will always have need for a machine of this kind.

It is moved by S. L. Hilton, seconded by William B. Day, that a sum not to exceed $150 be appropriated for this purpose.

The matter has been submitted to Chairman Koch of the Committee on Finance and has his approval.

A vote is being called for.

61. *Election of active members:* No. 274, Charles Henry Fletcher, 1130 Parker Ave., Detroit, Mich.; No. 275, E. Abraham Dziennik, 547 Lincoln Ave., Milwaukee, Wis.; No. 276, Walter R. Busenbark, Robinson, Kansas; No. 277, Harold Leon Miller, 821 E. 11th Ave., Winfield, Kansas; No. 278, Daniel Clayton McCrummen, Chapel Hill, N. C.; No. 279, Leo Albert Roberts, 905 Elm St., Hillsboro, Ill.; No. 280, Tony Barone, 5213 Burgess Ave., Indianapolis, Ind.; No. 281, Roy E. Huber, 947 N. Pennsylvania St., Indianapolis, Ind.; No. 282, Charles Henry Franz, 758 Terrace Ave., Indianapolis, Ind.; No. 283, David E. Soldinger, 1620 So. Ridgeway Ave., Chicago, Ill.; No. 284, Lloyd Nellis Riffer, Troy, Kans.; No. 285, Hiram E. Woerner, 7–15 N. Clay St., Coldwater, Mich.; No. 286, John B. Marwessel, 11th and Russell Sts., Covington, Ky.; No. 287, Margaret A. Stier, 3646 Warsaw Ave., Cincinnati, Ohio; No. 288, John Henry Mowery, 2282 Lath St., Cincinnati, O.; No. 289, William Sitman, Jr., 406 S. 3rd St., Bellwood, Pa.; No. 290, John Thomas Fenton, 410 E. Center St., Mahanoy City, Pa.; No. 291, Joseph A. Pierro, 1317 S. 6th St., Philadelphia, Pa.; No. 292, Charles E. Mullin, 3rd & Jackson Sts., Camden, N. J.; No. 293, H. Morton Cameron, 5400 Germantown Ave., Philadelphia, Pa.; No. 294, John Varga, 1299 Second Ave., New York City; No. 295, Frank Garfinkel, 141 Ave. "A," New York City; No. 296, Frank Rapecis, 275 E. 32nd St., Brooklyn, N. Y.; No. 297, Frank A. Munsch, 2815 Decatur Ave., Bronx, New York City; No. 298, Carmine J. Gianadaio, 247 E. 116th St., New York City; No. 299, Edward John Calvelli, 305 E. 112th St., New York City; No. 300, Basil Joseph Skelly, 371 E. Fordham Rd., New York City; No. 301, Adelaide Frances D'Albara, 174 Clinton Ave., Brooklyn, N. Y.; No. 302, Newton Harry Vogel, 948 Trinity Ave., Bronx, New York City; No. 303, Jack Neulander, 1040 E. 9th St., Midwood Manor, New York City; No. 304, Samuel Ushkow, 210 Throop Ave., Brooklyn, N. Y.; No. 305, Henry Sparhuber, 148 Kingsland Ave., Brooklyn, N. Y.; No. 306, Mayer J. Zuckermann, 224 E. 121st St., New York City; No. 307, Aurelio Caldevone, 238 Thompson St., New York City; No. 308, Edward Caso, 300 E. 152nd St., New York City; No. 309, Paul Mihkowsky, 169 Hamilton St., Bridgeport, Conn.; No. 310, Joseph Bronitsky, 572 Bedford Ave., Brooklyn, N. Y.; No. 311, James B. Hance, 57 Saratoga Ave., Yonkers, N. Y.

A. G. DuMez, *Secretary.*

SAVE THE HAGER MONUMENT!

The name of Hager, Dr. Hermann Hager, the Master of Pharmacy, is known the world over. His many works, especially his masterwork, "Pharmazeutische Praxis," have rendered and are still rendering valuable service in all branches of pharmacy throughout the civilized world. Like most great men Hager had no time to accumulate riches and consequently died poor. His many friends in 1897 erected a monument over his grave in Neuruppin. At that time the cemetery authorities received the sum of 1500 marks, the interest of which to be used for the care of the grave and monument. Owing to the low *valuta* this amount is now entirely insufficient. As the monument is in need of restoration an appeal is made to all pharmacists who appreciate the great Hager, for extra funds, which can be remitted to the Deutsche Pharmazeutische Gesellschaft, Berlin, Dahlem, or Dr. Hans Hager in Vienna I, Austria.

The *New York Apotheker Zeitung,* 140 John St., New York City, or its editor, Otto Raubenheimer, 1341 Fulton Street, Brooklyn, N. Y., would be thankful for all gifts, no matter how small, as a single dollar represents a great many marks at the present time. These subscriptions will be promptly acknowledged and forwarded to headquarters.

Surely the pharmacists in the United States should support this worthy cause in memory of the master of pharmacy! The members of the American Pharmaceutical Association who attended the Atlantic City Convention in 1916 will no doubt recall the Hager memorial meeting of the Historical Section at which a large photo of the master, who was an honorary member of the Association, was presented to the Association, and placed in charge of the Historian. O. R.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each Branch should see that at least three of its meetings during the year are reported in the JOURNAL.

CHICAGO.

The 134th meeting of the Chicago Branch of the American Pharmaceutical Association was held Friday evening, April 6, at 8:00 P.M. at the University of Illinois School of Pharmacy building, 701 S. Wood St., with President L. E. Warren in the chair. There was a large attendance, many of those present being pharmacists in the hospitals of Chicago and vicinity.

The evening was devoted to a discussion of hospital pharmacy which opened by H. S. Sanger of the Council of Hospital and Medical Education who spoke on the subject "The Field of Hospital Pharmacy." Mr. Sanger's paper which was accompanied by many state maps indicating the location of hospitals in the various states was of much interest and included not only complete statistical data but a number of important suggestions regarding a survey of pharmaceutical practice in the hospitals. The paper was received for publication and will be printed in a succeeding issue of the JOURNAL.

Dr. Egil T. Olsen, Superintendent of the Englewood Hospital, was the next speaker. Dr. Olsen is a graduate in pharmacy as well as in medicine. He served for a number of years as Naval Pharmacist and as Hospital Pharmacist in a private hospital and now has risen to the position of Superintendent of a very important city hospital. He, therefore, was especially qualified to speak on the subject "The Relation of the Hospital Pharmacist to the Medical and Administrative Corps." Dr. Olsen's paper also was received for publication. In the discussion of his paper, mention was made of business accounting for the pharmacist. The discussion brought out the fact that, while the impression is general that the work in a hospital pharmacy is exclusively professional and scientific, many items of business accounting as well as the teaching of materia medica and pharmaceutical practice to nurses are essentials of the routine. Dr. Olsen indicated that the practice of charging patients in the hospital for the medicine that they use was becoming more prevalent. Where this is done the pharmacy department is frequently put upon a self-supporting or nearly self-supporting basis with the result that qualified pharmacists are more generally employed in the hospitals and the field is undoubtedly widening. A number of hospital pharmacists in the audience were much interested in the dispensing of narcotics and the keeping of narcotic records.

Lieutenant Albert Albrecht of the Medical Service U. S. Marine Constabulary Detachment in Haiti and formerly Chief Pharmacist's Mate U. S. Navy, presented a very pleasing and instructive address covering some of his experiences in home and foreign lands. He has seen service in the Philippines, Panama, and Haiti.

He directed attention to the broad range of education required and to the varied duties and experiences of Pharmacist's Mate in the U. S. Navy; the presciption experience in the dispensary; the chemical examination of food supplies, water, stomach contents, etc., in the laboratory; the wide range of bacteriologic examinations and serologic preparations in the biological room; the stenographic and clerical work in the office. He presented also very interesting experiences in connection with the study of malaria and dengue fever and the elimination of mosquitoes in Panama and the Philippines and dwelt especially on the materia medica and practices of the native priests and medicine men of the "black republic" of Haiti.

Lieut. Albrecht received many expressions of appreciation for his splendid talk.

E. N. GATHERCOAL, *Secretary.*

INDIANAPOLIS.

As a variation from the usual custom, the Indianapolis Branch of the American Pharmaceutical Association held a joint meeting with the Purdue Section of the American Chemical Society at Purdue University, Lafayette, Indiana, March 24, 1923.

The Indianapolis Delegation which arrived at 2:00 P.M. was met at the station by the faculty and friends of the University, and taken in their cars to the School of Pharmacy Building where they were shown through the various departments. The thorough equipment was commented on by the visitors. Next the new Home Economics Building was visited and the up-to-date arrangements in every detail were especially interesting to the ladies. The fine library with its 60,000 volumes including every subject attracted the attention of the research men and the Mechanical Department with its machinery, foundry and accessories allured those mechanically inclined.

After visiting other departments on the campus the time had come to appear at the Chemistry Building for the program and quite an audience was awaiting the late arrivals.

The first number on the program was by Dr. M. G. Mellon of the Chemistry Department of Purdue. He had for his subject "The Use of Solutions of Inorganic Salts as Permanent Color Standards." An array of colors in tubes appearing as hundreds of rainbows, indicated the thoroughness of research work and the elaborate preparation for this subject, which was handled in a masterly manner.

Dr. Mellon stated that in presenting the theory of the action of neutralization indicators to the students in the course on the principles of quantitative chemical analysis, the change of the p_H value of the solution being titrated is shown by means of curves; and the p_H range of the various indicators is demonstrated by means of appropriate buffer solutions ranging from p_H 2 to p_H 11.

The color of some of the solutions thus prepared, such as methyl red and phenolphthalein, fades sooner or later, and an attempt is being made to match them with colored solutions of inorganic materials.

Such standards, if permanent, would be of use not only in teaching the action of indicators for titrations, but also, if prepared for the proper p_H intervals, for standards in the colorimetric determination of hydrogen ion concentrations.

Various colored systems are being tried. Tentative matches for a number of indicators have been made by means of Arny's combinations of cobaltous chloride, ferric chloride and cupric sulphate, or pentamino cobaltic chloride, potassium and tetramino cupric sulphate.

While Dr. Mellon does not claim to have arrived at a definite mixture of solutions for color standards, it appears that he is on the right track and that definite solutions of inorganic salts as permanent color standards will be the result of his work.

Following Dr. Mellon, Dr. R. E. Doolittle, chief of the Central District Bureau of Chemistry, then spoke on the "Shirley Amendments of the Pure Food and Drugs Act."

The wide experience of Dr. Doolittle in connection with the Pure Food and Drugs Law, having been chief of the New York district, overseeing the importations, naturally gave him a scope which had no limit, and it would be impossible to condense this notation without leaving out just what each individual would be most interested in and only those who were fortunate enough to be present can appreciate the subject.

Among some of the items of general interest might be mentioned that Dr. Doolittle stated that the first pure food law of any kind enacted was the Pure Tea Law. This Pure Tea Law has been enforced to the letter and there is less complaint on teas than on any other commodity.

Other laws following were directed at the quality of imports of foods and drugs and as this department is equipped to enforce the laws rigidly the quality of imported goods often supersedes those of home manufacture merely for the reason that the imports are more easily controlled.

The government laws are very effective on imports, also on goods sold through interstate commerce; but on goods sold only within the state they do not apply and that is why state laws are required to harmonize.

The Shirley amendment has helped the department considerably, but at that this law refers only to the statement on the label and any mis-statements made in the advertising matter can only be used as evidence in an attempt to deceive.

A pure Advertising Law is necessary to fill out a gap left in carrying out the enforcement of the Pure Food Laws as was originally intended.

At the conclusion of the meeting a rising vote of thanks was extended to Dr. Mellon and Dr.

Doolittle for their thorough presentation of their subjects.

Following the meeting a dinner was served at the Lafayette Club and here the entertainment was furnished by the students of Purdue School of Pharmacy.

ERNST STAHLHUTH, *Secy.-Treas.*

NEW YORK.

The March meeting of the New York Branch of the American Pharmaceutical Association was held on the 19th, at the New York College of Pharmacy. Owing to the absence of President Charles W. Holton, Henry B. Smith presided.

Clyde L. Eddy, for the legislative committee, reviewed the present status of legislative activities, both national and State. He referred to the recent charge of William J. Burns, director of the bureau of investigation of the United States department of justice, to the effect that druggists everywhere were willing to take the last shilling from narcotic addicts, and its denial by the N. A. R. D. He was of the opinion that the National Association of Retail Druggists should not content itself with a mere denial but bring an indictment against parties fathering such slurs on the drug trade.

Dr. Jacob Diner discussed the report and explained the provisions of proposed New York State narcotic legislation.

For the Committee on the progress of pharmacy Dr. G. C. Diekman presented a valuable report embodying abstracts from American and foreign journals. Among topics touched on were: Efficiency of ferments, crystallization of antipyrin and vanillin, sublimed sulphur changed by aging, uses and properties of ethylic glycol, new hypnotics of the veronal series and the preparation of a stable solution of manganese iodide.

Thirteen applications for membership were presented and action was taken electing them to membership.

Secretary Hugo H. Schaefer announced that Dean H. H. Rusby had been awarded the Remington Honor Medal and that formal award would be made at a dinner to be given at the Pennsylvania Hotel, April 16. Hearty approval followed the announcement.

Prof. Curt P. Wimmer spoke on "The Astronomic Conception of Atomic Structures." A vote of thanks was extended the speaker for his interesting presentation.

ASHEVILLE A. PH. A. MEETING.

The following announcement relating to rates and routes to the Asheville meeting of the American Pharmaceutical Association:

There are two comfortable routes open—by rail, and by water and rail.

A train leaves the Pennsylvania Station in New York City at 1:10 P.M., which arrives in Asheville at 11:15 the next morning. The carfare is $25.25. An upper berth costs $6.30, a lower berth costs $7.80.

There is mountain scenery, from Salisbury to Asheville.

The most interesting way to go is by boat from New York to Charleston, and from there across South and North Carolina by train. You can leave New York Thursday noon, via the Clyde Line, and arrrive in Charleston, S. C. Saturday noon. Our fellow member, Dr. W. H. Zeigler, assures us of an afternoon and evening's entertainment in Charleston.

Charleston is the most interesting town in the South—typically southern, full of history of the revolutionary period, and the Civil War. The sleeper from Charleston to Asheville is open at nine o'clock, making it possible to retire at will, and arrive in Asheville Sunday afternoon. This route affords a two-day sea trip, an enjoyable afternoon and evening in Charleston and a ride through the mountains.

The cost of the trip from New York to Asheville by boat and rail is $41.50. This figure includes the cost of berth and meals on the boat and a lower from Charleston to Asheville.

The Clyde Line offers more spacious staterooms with double or twin beds for an additional charge of $5 to $20.

Members who are contemplating a trip by auto can ship their cars uncrated from New York to Charleston for $1.98 per 100 lbs. There is an excellent road from Charleston to Asheville, and there will be several cars going from Charleston.

The trip made in this way would make it possible to avoid the uninteresting part of the journey at this end of the line, and avoid the troublesome roads of Virginia. Members making the trip in this way would have the advantage of the sea trip, then a good road arosss North and South Carolina, and could take a different route home, instead of simply coming and going the same way by auto.

Your committee will be very glad to make all reservations for your comfort from New York to Asheville, and will appreciate an early response from members who are going to make the trip.

(Signed) TURNER F. CURRENS, *Chairman*
Transportation Committee.

APRIL MEETING.

The April, 1923 meeting of the New York Branch of the American Pharmaceutical Association was called to order in the Lecture Hall of the New York College of Pharmacy Building, Monday April 9th, with President Holton in the chair.

Thirty-five members and friends were present.

Treasurer's Report: Treasurer Gerstner handed in a written report which was ordered filed with the thanks of the Branch.

Education and Legislation: Reported by C. L. Eddy.

Progress for the Rusby dinner was announced.

Dr. Moritz Dittmar read a very interesting paper on "The Phlobophenes," which was followed by a discussion. A vote of thanks was extended to the speaker.

HUGO H. SCHAEFER, *Secretary.*

NORTH CAROLINA.

The March meeting of the University of North Carolina Branch of the American Pharmaceutical Association was held at the Pharmacy Building, Thursday evening, March 29th.

A. L. Hogan read a paper on "The Synthesis of Aromatics Found in Plants Yielding Volatile Oils." The paper dealt mainly with advancement in chemical research in imitating true flower oils.

It was decided at this meeting to invite all of the members of the American Pharmaceutical Association in North Carolina to become affiliated with the local branch; a letter has been sent to the various members to this effect.

Program for the April meeting was announced.

Under the auspices of the University of North Carolina Branch of the American Pharmaceutical Association Dr. C. E. Malaby of Washington, D. C., who is in charge of the Department of Experimental Medicine, Southern District, Parke, Davis & Co., gave a series of lectures as follows:

Thursday, April 12, 1923.

11:45 A.M. "The Chemistry of Vitamines."

7:30 P.M. "Standardization of Drugs."

Friday, April 13, 1923.

11:45 A.M. "Smallpox and Vaccination."

7:30 P.M. "Pioneers in Medicine."

These lectures were very interesting and instructive and were attended by many members of the University Faculty, students of the Schools of Pharmacy and Medicine and Druggists of the town. The Branch feels grateful to both Dr. Malaby and the Company which he represents for giving us the benefit of their research work on the subjects covered.

ALMOND P. WESTBROOK, *Secretary.*

NORTHERN OHIO.

The regular meeting of the Northern Ohio Branch of the American Pharmaceutical Association was held at the School of Pharmacy Building, Western Reserve University, April 20, 1923.

The meeting was called to order by President Willard M. Fox. Chairmen of the Committees appointed by the President were as follows:

Membership—W. F. Hagemeister.

Professional Relations—Carl Winter.

Science and Practice of Pharmacy—L. C. Hopp.

Education and Legislation—Edward Spease.

Executive—Harry Placak.

Twenty-five were present to hear the very interesting address by E. E. Stanford on "Opium, Past and Present." A discussion followed, after which a rising vote of thanks was given Professor Stanford. An abstract of the address will be forwarded for publication.

The date of the next meeting was set for May 18, 1923.

E. D. DAVY, *Secretary.*

PHILADELPHIA.

The April meeting of the Philadelphia Branch of the American Pharmaceutical Association was held at the College of Pharmacy of Temple University. Including the students there were upwards of 200 present. On account of the absence of President Robert C. White, Vice-President H. Morton Cameron presided.

The minutes of the previous meeting were read and approved. The following applied for membership, subject to their acceptance by the parent organization: George H. Heckman, Nazareth, Pa.; H. F. Winger, Emaus, Pa.; H. D. Keiser, Milton, Pa.; Russell R. Williams, Paul Himmelberger, William Sitman, Jr., Bernard Laskowski and William A. Kelly of Philadelphia.

There being no further business of the Branch the speaker of the evening, Dr. Henry H. Boom, Professor of Hygiene and Physiology at Temple University was introduced, the topic of discussion being "Hygiene as Applied to Pharmacy."

Dr. Boom expressed the opinion that the pharmacist should not endeavor to devote too much time to what might be termed by some—professional activity—that the pharmacist was primarily in business to serve the public and advise, and, to do this effectively he could not devote any great amount of time to professional activities, if he must earn a livelihood. He further stated that the average pharmacist of to-day was in a business with keen competition and, therefore, should devote his time to business matters and leave to others the professional side of pharmacy. He was of the opinion that in the future most all of the real professional work that the pharmacists now perform would fall to those who might be termed technicians.

The speaker said that pharmacists could help the public most generously—by discouraging the use of nostrums and advising them along general hygienic lines, and on matters relative to which many people would not consult physicians; hygiene and sanitation could be promoted by pharmacists if they had a thorough knowledge of fumigation and disinfection and were capable of giving advice on the examination of food and water supplies —thereby they would aid in preserving health, improving health and preventing disease.

Drs. C. H. LaWall, John R. Minehart and Mr. E. G. Eberle took part in the discussion that followed.

A vote of thanks was tendered the speaker of the evening.

This season's meetings of the Philadelphia Branch, A. Ph. A., have been completed. The first meeting of next season will be held October 9, 1923.

JOSEPH W. E. HARRISSON, *Secretary.*

VIRGINIA.

On Saturday, April 14, The Virginia Branch of the American Pharmaceutical Association held a meeting in the auditorium of the Medical College of Virginia. There was a good attendance of members, and the pharmacy student body of the college was also present.

Dr. A. G. DuMez, of the U. S. Public Health Service, Washington, gave a very interesting and instructive talk on "Traffic in Narcotic Drugs as Revealed by Statistics." The talk was illustrated with numerous slides showing figures of the several countries with respect to the production, exportation and importation of narcotic drugs. From these figures Dr. DuMez demonstrated that it was reasonable to believe that instead of the one or two million drug addicts so glibly spoken of by some officials and the press, there were probably not more than one or two hundred thousand in the United States, making due allowances for smuggled drugs.

By invitation several members of the Richmond City police narcotics squad were present, and also a representative of the Federal Narcotic Division located in this city.

A. L. I. WINNE, *Secretary.*

LAWS AND MORE LAWS.

An editorial of the N. A. R. D. comments on the multiplicity of laws as follows:

"We are told that Congress and the state legislature together pass about 12,000 laws annually. Just think of it! Twelve thousand new laws being enacted right here in our own law-abiding country every year and every mother's son of us is expected to know all about each and every law that is passed by congress or the state legislature, for it is a well accepted principle in law that ignorance of the law is no excuse and cannot be set up as a defense. In other words, if we are haled into court, charged with the violation of any of those 12,000 laws that have been enacted during the past twelve months, we cannot offer as a defense our lack of knowledge of the existence of the law, nor of its application to us, and yet it is humanly impossible for any one of us to familiarize ourselves with all of these laws, and so we just naturally fall into the habit of breaking the law, though we may be utterly ignorant of its infraction. How much better it would be, therefore, if we had upon the statute books of the states and nation a reasonable number of well-defined laws, enacted for the purpose of regulating our action where such regulation is necessary, than it is for us to face the hopeless task of familiarizing ourselves with approximately 100,000 laws, more or less, now in existence."

ICHTHYOL SHALE IN TEXAS.

Drillers for oil on a farm near San Antonio, Texas, ran into a big ichthyol shale deposit, according to a dispatch in the *Boston Transcript*. The shale bed is only about 130 feet from the surface and, according to the claim, the yield of distillate from the samples tested was heavier than in the case of deposits in the Austrian and Swiss Tyrol districts. The same article states that ichthyol is now obtained from deposits near Burnet, Texas.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: A. G. DUMEZ, *Chairman;* S. L. HILTON, IVOR GRIFFITH, R. A. LYMAN, W. L. SCOVILLE, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Collaborators: JULIUS A. KOCH, President, A. Ph. A.; CHAS. H. LAWALL, President, A. C. P. F.; EDWARD WALSDORF, President, N. A. B. P.; E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; S. L. HILTON, Chairman, Council A. Ph. A. The Chairmen of the Sections, A. Ph. A.: ARNO VIEHOEVER, CROSBY B. WASHBURNE, W. F. GIDLEY, WALTER M. CHASE, CLYDE L. EDDY; E. F. KELLY and WILLIAM B. DAY of the House of Delegates; A. G. DUMEZ, Secretary of the Council; the General Secretary, and the Reporter on the Progress of Pharmacy.

RESEARCH ABSTRACTS.

VITAMIN POTENCY OF COD LIVER OILS. V. DOES THE ADDITION OF COD LIVER OIL TO THE PURIFIED DIET INFLUENCE REPRODUCTION IN THE ALBINO RAT?

By Arthur D. Holmes.

Shortly after weaning, normal albino rats were placed on a purified diet lacking Vitamin A. After xerophthalmia and malnutrition had been established, varying amounts of cod liver oil were added to the diet. The liver oils were crude, refined, rendered from fresh livers, rendered from storage livers, domestic, and foreign cod liver oils. With one exception the mating of experimental animals fed as noted above produced no young. With one exception the mating of experimental males with normal breeding stock females produced no young. In nearly every instance of the mating of experimental females with normal breeding stock males normal litters resulted.

FURTHER TESTS ON CHLORINE AS A PREVENTIVE OF INFLUENZA.

By Harrison Hale.

Tests made at the University of Arkansas, February 22nd to March 2d, 1923, inclusive, upon nearly 300 persons confirm the conclusion reached after tests made in February, 1920 that the daily breathing for five minutes of air containing small amounts of chlorine does act as a preventive of influenza.

CHEMISTRY IN PEACE AND WAR.

Brigadier General Amos A. Fries, chief of the Chemical Warfare Service of the United States Army, says that small quantities of "sneeze gas," recently developed by his department, would, if introduced in small quantities into illuminating gas, largely prevent suicide by the gas route, or even rescue victims of accidental asphyxiation by awakening them to their peril.

Among other peace-time uses of some of the inventions of war-time, a new mask has been perfected, named by General Fries the "all-purpose canister," which can be used by fire fighters where gas pipes are leaking or by men engaged in fumigating ships or buildings.

Gases are also employed for the annihilation of pests, such as the cotton boll weevil, which is responsible for damage annually amounting to many millions of dollars.

DRUG CULTURE A CENTURY AGO.

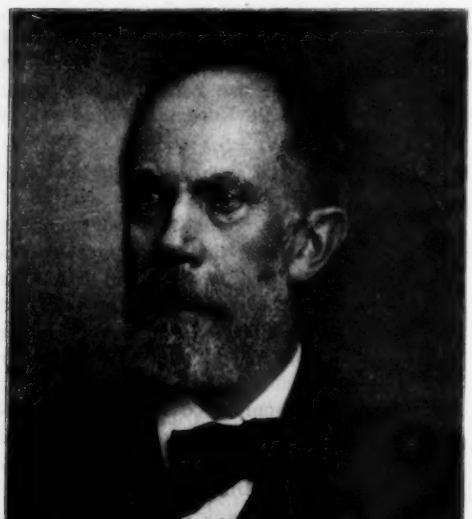
The *National Gazette* of March 14, 1826, contains an announcement by Charles Marshall, President of the Philadelphia College of Pharmacy, "offering a premium of $50 to the gardener residing within 10 miles of Philadelphia who shall during the ensuing summer cultivate and dry, and in the best manner, the greatest quantity and variety of medicinal herbs and plants."

PERSONAL AND NEWS ITEMS.

Dr. George Kimball Burgess has been appointed director of the Bureau of Standards to succeed Dr. S. W. Stratton. Dr. Burgess entered the Bureau of Standards in 1903, and was a member of the scientific mission which was sent abroad when the United States entered the war in 1917, to study means of scientific coöperation with the Allies.

"Ted" Mallinckrodt, of the Mallinckrodt Chemical Works, St. Louis, sailed on the Mauretania recently bound for England, the Continent, and finally Africa, where he will hunt big game.

Wilhelm Bodemann, after a span of sixty years, has retired from active drug business, having sold his store to his nephew, Julius Schroeder, who has been the veteran's assistant for thirty-seven years. For fifty-four years Mr. Bodemann has been active in the drug business in Chicago, and his influence



WILHELM BODEMANN, C. V. D. A.

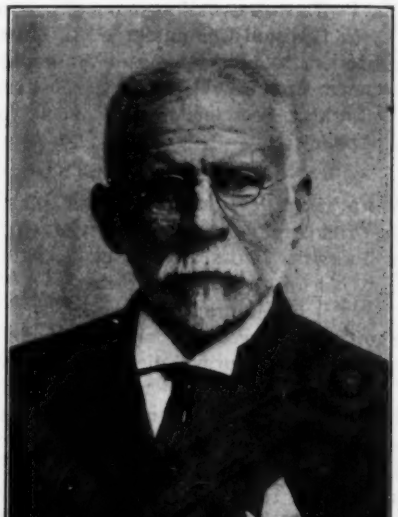
in local, State and national organizations has been pronounced, always ready with counsel and support of that which he believed to be for the best interests of the drug trade and pharmacy. His interest in the associations to which he is devoted will continue.

Bodemann's "Ceterum Censeo" re Veteran Druggists' Associations is becoming effective; such social organizations have been established in Milwaukee, Minneapolis, St. Paul and, more recently, in New York City. The C.V.D.A. of Chicago is famous and the fraternal spirit of the members is an influence for good—the motto is "Cheers for the living and tears for the dead." Each member contributes an autobiography, that of Wilhelm Bodemann is intrusted to the *Western Druggist,* to be printed when tears will testify to his long and useful life, some twenty-five years or more hence.

The program of the April meeting of the New York Veteran Druggists' Association was enhanced by accounts of early experiences of several members; among those who contributed thereto were:

J. M. Gray, who started as an office boy with Schieffelin & Company, and now is manager of the city department.

Adrian Paradis entered the drug business in 1871, and graduated from the New York Col-



THOMAS D. McELHENIE.
Honorary President, A. Ph. A., and New York Veteran Druggists' Association.

lege of Pharmacy in 1876.

George Diekman spoke of his early experiences in the drug store—powdering cork in a mortar and other equally interesting tasks were assigned him by older clerks of the store.

Robert Lampa, vice-president of Lehn & Fink, spoke of the help given him by Mr. Fink in acquiring a knowledge of pharmacy. He attended classes at Cooper Union before entering the New York College of Pharmacy.

Miss Edna Flook, who has been Professor Day's secretary for several years past, has resigned the position now filled by Miss Sylvia F. Sanders. The former has reported the proceedings of the Illinois Pharmaceutical Association and is favorably known to Illinois members.

Carl Whorton of Gadsden, Ala. was the honor guest of the Pharmaceutical Society of the Alabama Polytechnic Institute at Auburn on the occasion of a banquet April 16.

F. E. Holliday was one of the principal speakers at the meeting of the Southern Drug Club in Birmingham, Ala., April 12.

E. L. Maines has joined the staff of J. L. Hopkins & Co., crude drug merchants, New York City, in the capacity of chief chemist and superintendent.

Carl Weeks, president of Armand Company, and of a bank in Des Moines, is visiting in Europe.

C. O. Bigelow has returned from a month's visit in Pinehurst, S. C.

Edward Sher, ex-president of the New York Retail Druggists' Association, was recently presented with a valuable silver service in appreciation of his efforts on behalf of this association.

Ex-president Caswell A. Mayo and his drug plant garden were sketched in a Sunday edition (April 8th) of the *Cincinnati Commercial*. Nearly a full page of the Magazine Section was devoted to the description of the garden, and a half-tone of our fellow-member centers the illustrations.

Chairman Arno Viehoever of the Scientific Section, A. Ph. A., is the subject of an interesting article in the April number of the *Northwestern Druggist*, as "The Man Who Guards our Drugs," by E. E. Stanford. The activities of Dr. Viehoever are interestingly related, pharmacognosy as a science is discussed, and the work of the department over which the subject of the sketch presides is dealt with in giving an account of his contributions to science.

F. E. Mortensen, president of the Colorado Board of Pharmacy, is sojourning in California.

M. Valère Haazen, president of the Pharmaceutical Society of Antwerp, was signally honored by his *confrères* on the occasion of the banquet held recently in celebration of the eighty-seventh anniversary of the society to the interests of which and of pharmacy in Belgium M. Haazen has given forty years' continuous and devoted service. The large and representative gathering included Dr. Hofman, the Hague (Secretary to the Central Committee of the International Pharmaceutical Federation), MM. Vaudin (France) and Pattou (Brussels). During the course of the proceedings a bronze medallion of M. Haazen was unveiled and miniature replicas of the portrait were distributed, and a copy of the *Livre d'Or* produced by M. J. E. Boschmann, of the Musee Plantin, for which 118 members of the Society have subscribed, was presented to the Society and accepted on its behalf by the President.—*The Journal and Pharmacist*, April 14.

Four scientists on April 11th received the John Scott medal, carrying with it awards of $1000, from the City of Philadelphia at a meeting of the American Philosophical Society.

The recipients of the honor were Sir Joseph Thompson, F. R. S., of Trinity College, Cambridge, England, Arthur L. Day, Ph.D., director of the geophysical laboratory of the Carnegie Institution, Washington, who developed optical glass during the war; C. Eijkman, M.D., of the University of Utrecht, Holland, whose experiments toward counteracting the beri-beri disease led to a new study of dietary disease, and Francis William Aston, F.R.S., also of Trinity College, the developer of the mass spectrograph.

Sir Joseph also received the Benjamin Franklin Medal from the Philosophical Society.

The John Scott Medal was explained in Volume X, JOURNAL A. PH. A., p. 394.

The fiftieth anniversary of Luther Burbanks start in horticulture is now (May 17–20) being celebrated in Santa Rosa. Scientists and leaders in every walk of endeavor are paying tribute to the leader of the horticultural world.

One of the National Drug Stores, located in the Woolworth Building, New York, has discontinued the prescription department.

Eli Lilly & Company recently purchased a building at 79–81 Spring Street, New York, where their offices have been located, after remodeling the building.

N. W. Ayer & Son, during Art Week, had on exhibit—for the public, classes in advertising and illustration at the University of Pennsylvania and artists—drawings and paintings recently used in advertising. The exhibit attracted many visitors.

The April *Bulletin of Pharmacy* presents a page of half-tones under the caption of "In the Days of Bow Ties." Due consideration is given the subjects in the statement—"As they looked twenty or so years ago."

CERTIFICATE OF RECOGNITION AWARDED TO THE RAUBENHEIMER PHARMACY.

At the Industrial Exposition held in the 23rd Regiment Armory, Brooklyn, N. Y., April 7th to 14th, the Chamber of Commerce awarded a number of Certificates of Recognition to industrial, commercial and professional institutions, that have been in business over 25 years in the Borough of Brooklyn.

It is a pleasure to note that one of Brooklyn's oldest and well-known professional pharmacies obtained such a certificate, *i. e.*, the Verona Pharmacy, 1341 Fulton Street, corner Verona Place, established in 1874 and serving the community continuously during the past 49 years. The owner is our fellow-member, Prof. Otto Raubenheimer, who is justly proud of the handsomely engraved Certificate of Recognition.

SAFEGUARDING THE FUTURE OF EMPLOYEES.

Every employee of Parke, Davis & Company in the United States and Canada has been given an insurance policy for a thousand dollars, the premiums to be kept up by the company as long as the employee remains with the house.

OBITUARY.

GEORGE FREDERICK PAYNE.

Dr. George F. Payne, president of the American Pharmaceutical Association, 1902–3, died at Atlanta, Ga., April 18, aged seventy years. He attended the School of Mines,

GEO. F. PAYNE,
President, A. Ph. A. 1902–1903.

Columbia University, in 1873, and in 1876 graduated from the New York College of Pharmacy. After graduation he was associated with his father in the drug business at Macon, Ga. In 1890 he was appointed state chemist, which position he held until 1898. In 1891 he completed a course in medicine in Atlanta Medical College, and shortly thereafter became dean of Atlanta College of Pharmacy. He served on the Georgia Board of Pharmacy, was a member of the U. S. P. Revision Committee of 1890–1900, and a former vice-president of the National Association of Boards of Pharmacy. Mrs. Payne and a daughter survive the deceased.

ALBERT EUGENE CLYDE.

Albert Eugene Clyde, well-known pharmacist of Glencoe, Illinois, died February 1, 1923. He was a member of the American Pharmaceutical Association, having joined the Association a year ago, and was also a member and at one time one of the supervisors of the Chicago Retail Druggists' Association.

Mr. Clyde was born in Janesville, Wisconsin, April 3, 1877; son of Edward S. and Janet Cahill Clyde. He attended grammar and high schools in Buffalo, No. Dakota, and came to Chicago in 1895 to attend the School of Pharmacy, University of Illinois, from which he was graduated in 1897.

After clerking in Chicago for four years, Mr. Clyde established himself in the drug business at Glencoe in 1901 and soon built up a prosperous business.

His wife, Mrs. Pearl G. Clyde, and two children, Dorothy Janet and Samuel Edward, survive him.—W. B. D.

GEORGE HENRY SCHAFER.

George Henry Schafer, Honorary President of the American Pharmaceutical Association 1914–1915, died at his home in Fort Madison, Iowa, April 8, 1923. He was born in the city which was his home during his eventful life on July 15, 1847. Here he also received his early education which was completed at Western Union College and Military Academy in Fulton, Ill. He entered the drug business of McFarland and Eckhart in Fort Madison in 1862 and six years later became a partner in the firm, and in 1872 the sole owner. Later the son, Robert R. Schafer, entered into partnership with his father and the business is continued by him.

Throughout life Mr. Schafer took a deep interest in pharmaceutical affairs and in the drug industries generally. He was author of the Iowa Pharmacy Law in 1880, one of the organizers of the Iowa Pharmaceutical Association and its first president. He served on the first Iowa Board of Pharmacy holding office for eight years. He was largely instrumental in the establishment of a Department of Pharmacy in the State University.

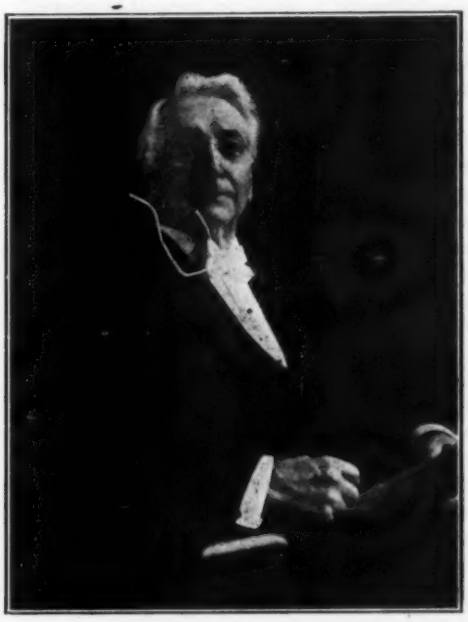
Mr. Schafer joined the American Pharmaceutical Association in 1871, and was elected first vice-president in 1890. Owing to the unavoidable absence of President James Thornton Shinn, Mr. Schafer presided over the Kansas City A. Ph. A. meeting in 1881. The president knowing that it would be impossible for him to attend the meeting requested the vice-president to prepare the annual address which exhibited wide and thorough acquaintance with pharmaceutical affairs.

GEORGE H SCHAFER,
Honorary President, A. Ph. A., 1914–1915

Mr. Schafer was a member of the Presbyterian Church and of the Masonic bodies of Fort Madison. He is survived by his widow and two children by former marriage, Robert R. Schafer and Mrs. Louise Young of Chicago. Mr. and Mrs. Schafer were in attendance at the Cleveland meeting and the deceased looked forward with a great deal of interest to attending the Asheville meeting of this year.

WILLIAM N. WILSON.

The death of William N. Wilson, an ex-president of the Louisiana Pharmaceutical Association, has been reported. Mr. Wilson was graduated from Tulane University, School of Pharmacy, and thereafter established himself in business in Independence, La., where he enjoyed the friendship and high esteem of the citizens. He was unanimously elected president of the Louisiana Pharmaceutical Association, in 1920. The deceased had been in poor health for several years prior to his death. He is survived by his widow and two daughters, Mrs. Pugh and Miss Lurline Wilson. The latter is a pharmacist and has had charge of her father's store during the past year. Mr. Wilson joined the American Pharmaceutical Association in 1921.



OLIVER F. FULLER
Honorary President, A. Ph. A., 1918–1919.
The death of Mr. Fuller was reported in the April JOURNAL A. PH. A., p. 371; a sketch of the deceased is printed in the October number, 1918, p. 843.

FRENCH FACULTY OF PHARMACY AUTHORIZED TO ISSUE DIPLOMAS IN FOOD ANALYSIS, MICROBIOLOGY AND PARASITOLOGY.

The Faculty of Pharmacy of the University of Strasburg has been officially authorized to issue diplomas or certificates of competency in (1) Food Analysis, (2) Microbiology and Parasitology. For the former, four semesters' special study will be required preliminary to the examination. For the latter two semesters will suffice, but candidates must hold the pharmaceutical diploma. The general idea is "to favor the aptitude of young pharmacists and render them capable of executing analyses demanded by the Courts."

SOCIETIES AND COLLEGES.

REORGANIZATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The pharmaceutical press has accorded considerable space to the Reorganization Plan of the American Pharmaceutical Association, and thanks are due for this coöperation. Some have published the communications from the House of Delegates A. Ph. A., in full, and others have commented editorially. The acknowledgment is made in general so that all may be included in the expression of appreciation. We take the liberty of reprinting part of an editorial comment:

"As finally adopted by the Association, it (the reorganization plan) is free from most of the features which seemed at first to render it objectionable to the members who were interested in preserving the organization as a bulwark of professional pharmacy and may safely be supported by all pharmaceutical associations. The plan offers a means of interesting more of the State societies in the work of the parent organization and it is to be hoped that the State associations as they meet during the coming months will approve these plans for a real national federation of pharmacy. The opportunity is here and every pharmacist should attend his State meeting with the one thought uppermost in his mind of putting his State solidly back of the big task to be accomplished."

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The report of Treasurer E. F. Kelly will be printed in full in the forthcoming YEAR BOOK; an abstract will appear in a later issue of the JOURNAL. At this time only a summary of the assets of the Association is given: Permanent funds, $72,735.93; funds held in trust, $12,337.78; current funds, $29,711.57—total $114,785.28.

AMERICAN PHARMACEUTICAL ASSOCIATION RESEARCH FUND.

The American Pharmaceutical Association has available a sum amounting to $400 which will be expended after October 1, 1923, for the encouragement of research.

Investigators desiring financial aid in their work will communicate before June 1st, with H. V. Arny, Chairman, 115 W. 68th St., New York.

THE REMINGTON HONOR MEDAL AWARD.

Ex-President H. H. Rusby of the American Pharmaceutical Association, dean of the College of Pharmacy of Columbia University, was formally awarded the Remington Honor Medal for 1923 at a banquet in Hotel Pennsylvania,

REMINGTON HONOR MEDAL.

New York City, April 16. There were present to do honor to the recipient more than 200 guests representing every line of pharmaceutical activity and of the branches closely related to pharmacy.

The arrangements for this delightful function were made by a committee of the New York Branch of the American Pharmaceutical Association. The banquet was presided over by Charles W. Holton, president of the Branch, who introduced the speakers, after making preliminary remarks relating to the occasion.

The first speaker was Dr. Augustus S. Downing of the Department of Education of the State of New York. He testified to the worth of Dr. Rusby's contributions to education. Dr. Harvey W. Wiley spoke of his association with the honored guest in the days following the enactment of the Federal Food and Drugs Act, and how from that association and experience a lasting friendship and esteem resulted. Milton Campbell, president of the Mulford Exploration Expedition to the body of the

Amazon, told about "Rusby the Explorer"—not only in relation to the recent expedition, but also those of earlier life in Arizona and the Southwest and in South America. President Julius A. Koch of the American Pharmaceutical Association referred to the work of Dr. Rusby in various organizations of which both of them were members. Marshall A. Howe, curator of the New York Botanical Garden, gave those present an insight into tremendous work done by Dr. Rusby along botanical lines, and the

H. H. RUSBY

Provost of Columbia University, Dr. William H. Carpenter, paid tribute to "Rusby the Dean" and then spoke of his more intimate friendship during many years.

Professor Hugo H. Schaefer has been the secretary of the Remington Honor Medal Committee ever since the establishment of the award and conducted the transactions with his usual care and promptness. Dr. Jacob Diner, senior past president of the New York Branch, A. Ph. A., presented the medal to Dr. Rusby and characterized the recipient as "a full-sized man."

The medal is given as a recognition of distinguished service and to stimulate others to excel in branches of pharmacy for the service of humanity. This may have served as the text for Dr. Rusby when he accepted the medal, for in recalling incidents of his early youth he clearly indicated the value of the influences of teachers and others who had contributed largely in shaping his life. "Success," he said, "comes as the result of many factors and as the culmination of long endeavor."

Among former recipients of the medal present at the banquet were Professor J. U. Lloyd of Cincinnati, and Dr. H. V. Arny. Dr. J. H. Beal was unavoidably absent because of attendance at a meeting of Board of Trustees, U. S. P.

AMERICAN MEDICAL AID FOR RUSSIA.

The following is part of an appeal received in the Journal office:

"The American Medical Aid for Russia, 103 Park Ave., New York City, with a National Committee of distinguished physicians and surgeons, and a National Trade Committee of prominent manufacturers, exists to make the terrible conditions prevailing in Russia known to the generous American public.

"It pleads for *soap*. Soap alone combats typhus, and Russia has had 25,000,000 cases of typhus in the last five years. It pleads for *quinine*. Quinine alone can check the malignant malaria from which millions are suffering. It needs hospital supplies of all kinds.

"Through arrangements with the American Friends' Service Committee, of which it is the *medical section*, the American Medical Aid for Russia will apply all contributions of money and supplies to the direct relief of Russian doctors, nurses and hospitals, without charge for transportation or administration.

"Every medicine and type of supplies can be used in Russia—can be made to go an incredible way. When everything sent, great and small, can be made to perform so great a work of mercy, will not each reader of this appeal without exception—manufacturer, jobber or retailer—hurry in his contribution?

"Supplies (packed for export where possible) should be sent to the American Friends' Service Committee Storeroom, 1541 Cherry St., Philadelphia, Pa.

"Please address all correspondence to Frances Witherspoon, Sec. American Medical Aid for Russia, 103 Park Ave., New York City."

AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

The Twelfth Annual Meeting of the American Drug Manufacturers' Association was held in New York City, April 16–19. Important matters relating to narcotic regulations, legislation, pharmaceutical progress, scientific research, medical chemicals and other subjects were discussed in the various sections.

A most successful meeting was closed with a banquet on April 19, at which the Hon. Royal S. Copeland, newly elected Senator from New York State, and the Hon. James A. Reed, Senator from Missouri, were guests of honor.

The officers elected for the ensuing year were: President A. S. Burdick, Chicago; First Vice-President, S. B. Penick, New York; Second Vice-President, Willard Ohliger, Detroit; Third Vice-President, Ralph R. Patch, Boston; Secretary, A. Homer Smith, of Washington, D. C.; Treasurer, Franklin Black, New York.

The report of President W. A. Sailer dealt fully with the problems of the association during the year and sounded a note of optimism as to the present condition of the organization. He also paid high tribute to the work done by A. Homer Smith in the reorganization of the Washington office and the constant addition by this office to the list of services rendered to members.

Papers read before the Scientific Section and discussed included the following: "Synthetic Organic Chemicals," Dr. Jules Bebie; "Control Assays," Dr. J. M. Francis; "Crude and Milled Drugs," Isaac V. S. Hillier; "Diluents and Excipients," Dr. R. W. Proctor; "Drug Extracts," Dr. J. P. Snyder; "Essential Oils," Dr. G. F. Richmond; "Alkaloid and Drug Standards," Dr. J. Rosin; "Digestive Ferments," Dr. Frederic Fenger; "Pharmacological Assays," Dr. A. L. Walters; "Labels," Mortimer Bye; "Surgical Dressings and Plasters," Dr. F. B. Kilmer; "Status of the U. S. P. Revision," Prof. E. Fullerton Cook. One of the outstanding features of the session, according to Dr. R. W. Proctor, chairman of the section, was the report of Dr. Walters in which he told of methods by which aconite, which has always deteriorated with age, may now be kept for years with its strength unimpaired.

Senator Copeland said in his address: "I feel that in a way I am going to Washington as the ambassador of the medical and pharmaceutical professions. I know that you have been embarrassed by the multiplicity of regulations regarding the handling of your products and I will aid in straightening out these difficulties to the best of my ability."

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION.

The most successful meeting of the American Pharmaceutical Manufacturers' Association was held in Altamonte Springs, Florida, March 19–24. Over one hundred members and their wives were in attendance.

The address of welcome was given by the Mayor of Altamonte Springs, Mr. B. L. Maltbie, also president of the Maltbie Chemical Company, Newark, N. J. The business sessions were featured by addresses on Sales Management, Office Efficiency, Credits and Collections, Laboratory Efficiency, Employment Problems, Workers' Compensation and Health Insurance, Legislation and Publicity.

Mr. Irving Bacheller, the well-known novelist, gave a short address. Many interesting entertainment features and beautiful drives made the meeting a most enjoyable one for both the ladies and the men. An impressive address was given by Mr. Chas. Wesley Dunn, of New York City, General Counsel for the American Pharmaceutical Manufacturers' Association.

The following officers were elected to serve for 1923–1924:

R. M. Caine, President, Indianapolis, Indiana; W. H. Rorer, Vice-President, Philadelphia; Don C. Westerfield, Second Vice-President, Dayton, Ohio; Ralph R. Patch, reëlected Secretary-Treasurer, Boston, Mass.

The next meeting is scheduled to take place at French Lick, Indiana, the latter part of May 1924.

NATIONAL ASSOCIATION OF DRUG CLERKS PURCHASE HOME.

The National Association of Drug Clerks has purchased the site of the old Spring Lake sanatorium, Palmyra, Wis., with 90 acres about it, to be converted into a summer resort property and a home for superannuated and needy drug clerks of the United States. In addition, plans are under way for establishing at the home a research laboratory for serums and medicines and a botanical garden for the cultivation of medicinal plants. The property will be known as the P. A. Mandabach Memorial Druggists' Home, the name being chosen in honor of the founder of the association.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION TO MEET IN CLEVELAND.

The 49th Annual Convention of the National Wholesale Druggists' Association will be held October 8th to 11th, inclusive, at Cleveland, Ohio.

The Association has not met in Cleveland since 1882 and there is every indication of a large attendance this year. The Convention headquarters will be at Hotel Cleveland.

STATE PHARMACEUTICAL ASSOCIATION MEETINGS OF MAY AND JUNE.

May meetings of State Pharmaceutical Associations:

Arkansas at Little Rock, 8–10; Kansas at Wichita, 15–17; Louisiana at New Orleans, 15–17.

The meetings scheduled for June are: Alabama at Birmingham, 6–7; California at Eureka, 13–15; Colorado at Glenwood Springs, 19–21; Delaware at Wilmington, 7; Georgia at Augusta; Illinois on board S. A. Lake Steamer, 19–23; Indiana at Culver, 19–21; Kentucky at Louisville, 19–21; Maryland at Buena Vista Springs, Pa., 19–22; Massachusetts at Swampscott, 13–14; Michigan at Grand Rapids, 12–14; Mississippi at Meridian, 12–13; Missouri at St.Louis, 12–15; New Jersey at Spring Lake, 12–15; New York at Stamford, 19–23; North Carolina at Greenville, S. C., 26–28; Pennsylvania at Bedford Springs, 12–14; South Carolina at Greenville, 26–28; Texas at Galveston, 12–14; Utah at Provo, 27–28; Virginia at Virginia Beach, 25–27; West Virginia at Deer Park, Md., 26–28; Wisconsin at Baraboo, 19–22.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.

"Try the Drug Store First" was one of the principal subjects considered by the Oklahoma Pharmaceutical Association in convention at Oklahoma City, April 17, 18 and 19. A campaign to secure units at five dollars each, to the amount of $27,000 to be used for the purpose of establishing the "unit system," the maintenance of a salaried secretary, which has been in effect in Oklahoma for the past year, were heartily approved and the convention was pledged to give the secretary all possible assistance in association movements.

Roscoe Hadley of Oklahoma City was elected president for the ensuing year; Clarence Anderson of Hugo and W. S. Pool of Duke, vice-presidents; and W. S. Shackelford of Wynnwood, secretary-treasurer.

MINNEAPOLIS VETERAN DRUGGISTS' ASSOCIATION.

The Minneapolis Veteran Druggists' Association was organized at a meeting in the West Hotel, April 13. Chas. H. Huhn was elected president and Frederick J. Wulling, dean of the College of Pharmacy, temporary secretary. Other officers elected were: J. H. Marshall, vice-president; A. J. Kline, assistant recording secretary; Fred A. Klenert, corresponding secretary; C. A. Robinson, treasurer. Dean Wulling, owing to his many activities in other allied and civic organizations, declined election as permanent secretary, but agreed to act as secretary until the organization was fully completed. Druggists who were actively engaged in pharmacy in 1892 are requested to send in their names, if they desire to be enrolled as charter members. All other druggists who have been connected with the drug business during the past twenty-five years are eligible to membership. The program followed by the C. V. D. A. is to be quite closely followed.

CITY OF WASHINGTON RETAIL DRUGGISTS' ASSOCIATION.

Paul Pearson was elected president of the Washington Retail Druggists' Association, April 14. The organization was addressed by Robert N. Harper, Washington banker, formerly a pharmacist. Professional entertainment was furnished.

Other than Mr. Pearson, the new officers are Fred W. Walker, vice-president; Norman D. Parker, secretary; and Wymond H. Bradbury, treasurer.

FOURTH ANNUAL MEETING OF THE PALESTINE PHARMACEUTICAL ASSOCIATION.

The Palestine Pharmaceutical Association was organized in Jerusalem four years ago, and has a number of branches in Palestine. The membership includes more than eighty qualified licensed pharmacists—Christians, Jews and Mohammedans. Its aim is to uplift the moral and material situation of the pharmaceutical profession in Palestine.

The Department of Health of the Government of Palestine commends the Association and expresses appreciation of services rendered, in its Annual Report.

At the recent annual meeting of the Palestine Pharmaceutical Association—Central Branch, Jerusalem, Miss Fabritz, M.P.S., of London gave an address on "Pharmacy in England," and Miss S. Oxfield, Ph.G., of New York spoke on "Pharmacy in America."

The second section convened on February 25th and was held at Bristol Gardens; Hon. President Ch. Gotonopolis opened the meeting. President A. Halaby, Ph.M., spoke on the profession in general and thanked the government for the help given to the Association since its organization. He also thanked the Government Inspector of Pharmacies, Farid

Haddad, Ph.M., for his interest in the Association.

Secretary J. Michlin, Ph.M., reported the transactions of the Executive Committee during 1922. He referred to the activities in having only qualified pharmacists as dispensers and the favorable action on other matters by the Director of Health. He also spoke of successful conferences relating to hospitals and dispensaries, the coöperation of medical and pharmaceutical associations and concluded with reports on the establishment of branches.

Treasurer A. Kosviner, Ph.M., rendered his financial report. The new officers are as follows: The Honorary President was reëlected;

Reading from left to right: President A Halaby, Miss S. R. Oxfield, New York; Secretary J Michlin.

Farid Haddad, President; E. Oplatka, Vice-President; the Secretary was reëlected; M. Hausdorff, Treasurer; Anton Halaby, Miss Fabritz and A. Kosviner were elected members of the Committee. Messrs. Gotonopolis and J. Michlin were named representatives of the Association for the reception given to Professor Einstein.

At the meeting of the Palestine Pharmaceutical Association on March 29th, Savas Carnapas, Ph.M., spoke on "Patent Medicines." A resolution was passed to the effect that doctors and pharmacists should as far as possible discontinue the sale and use of these preparations. Further consideration of the matter is to be given at another meeting. This closed the first of a series of meetings devoted to scientific subjects, which were largely attended by physicians and pharmacists.

NOTES RELATING TO SOME OF THE COLLEGES OF PHARMACY.

Dean Wulling began the annual course of historical pharmaceutical lectures at the College of Pharmacy assembly on April 5, the initial lecture being on William Procter, Jr. Succeeding lectures in the series will cover the lives of Edward Parrish, Charles Rice, P. W. Bedford, E. R. Squibb, John M. Maisch, Oscar Oldberg, and others.

The Regents of the State of New York have announced that the New Jersey College of Pharmacy is now fully registered in that State for its two-year course leading to the degree of Ph.G.

The Health Exposition to be held in Detroit June 7–16 will have, among others, representative booths maintained by the Detroit branch of the A. Ph. A. and the various schools of pharmacy in the vicinity.

A special moving picture of Purdue University has been made and will be shown throughout the state. Views of the campus, demonstrations of work being done by the different departments, etc., are some of the phases of the university pictured. The film will be sent to all organizations and high schools requesting it. Several scenes were made in the Pharmacy Building.

The Oregon Agricultural College School of Pharmacy will discontinue the two-year curriculum, beginning with the school year 1923–24. The students apparently realized that the two-year curriculum was inadequate because only four students out of 185 registered for the two-year course.

The College of Pharmacy, University of Washington, has discontinued the two-year course in pharmacy.

W. J. Husa, '13, Ph.C., instructor in chemistry at University of Iowa School of Pharmacy, has accepted a position as professor and head of the department of pharmacy at the University of Florida, at Gainesville. Mr. Husa will receive his Ph.D. degree in June and expects to enter upon his new duties at the beginning of the next school year.

CHEMISTS' EXHIBITION.

A communication has been received from Hon. Harold Fox, Vice Consul, British Consulate in Philadelphia, advising that the 25th Chemists' Exhibition will be held at the Cen-

tral Hall, Westminster, London, S. W., from the 18th to the 22nd of June 1923. The Exhibition will consist of a most comprehensive display of drugs, chemicals and allied goods, and it is attended not only by the pharmacists of Great Britain and the Overseas Dominions, but by a considerable number of gentlemen from other countries interested in the drug and chemical trades. Admission is given on presentation of trade card.

THE PHARMACIST AND THE LAW.

RESOLUTIONS OF AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

Among the resolutions adopted by the American Drug Manufacturers' Association during the recent annual convention are the following:

GOVERNORS' CONVENTION.

WHEREAS, The President of the United States has called a conference of the Governors of the various States for the purpose of considering ways and means of more effectively enforcing the national prohibition act;

Now, therefore, be it resolved, That this association desires to invite the attention of such conference to the importance of safeguarding the needs of lawful industry to the end that an ample supply of alcohol shall always be available for those lawfully entitled to use it.

MODEL NARCOTIC BILL.

Resolved by the American Drug Manufacturers' Association, That the model State narcotic bill, so-called, is approved only as to its provisions which relate to the manufacture and distribution of drug narcotics; *be it further resolved* that inasmuch as the other provisions of said bill do not relate to the manufacture and distribution of narcotic drugs it neither approves nor disapproves of such provisions.

INDUSTRIAL ALCOHOL COMMISSIONER.

Resolved, That the American Drug Manufacturers' Association desires to express its unqualified approval of the recommendation heretofore made to the Commissioner of Internal Revenue that there be a separation of the functions of the supervision of alcohol for industrial purposes by the appointment of an industrial alcohol commissioner to take over the administration of the permissive provisions of the national prohibition act.

STATE LAWS.

New York State Legislature has passed the Twomey bill, which requires that only licensed druggists and pharmacists can own or operate drug stores. The legislative committee, strongly supported by druggists, and the untiring efforts of the committee mentioned made the success possible. Arizona druggists were unsuccessful in having a bill passed to regulate the practice of pharmacy. A bill became law prohibiting the sale of peyote.

California druggists hope to be successful in passing a prerequisite law. Idaho created a law relating to State licenses for the sale of alcohol which provides that duly licensed pharmacists shall not be required to obtain a special license for this purpose. It is the theory of the bill, which the legislature accepted, that the general license of the pharmacist is sufficiently broad to include also this purpose.

TRADE ALCOHOL ADVISERS NAMED.

Appointment of an advisory committee representing users of industrial alcohol was announced April 27th by Commissioner of Internal Revenue Blair. The committee is made up of ten members, representing ten different organizations. Its purpose is to confer with and advise the prohibition unit on questions relating to the use of industrial alcohol.

Following are members of the committee:

Dr. H. E. Howe, Washington, D. C., editor of *Industrial and Engineering Chemistry,* representing the American Chemical Society.

William A. Sailer, Baltimore, president of Sharp & Dohme, and also president of the American Drug Manufacturers' Association.

William J. Schieffelin, New York, representing the National Wholesale Druggists' Association.

Samuel C. Henry, Chicago, representing the National Association of Retail Druggists.

Martin Ittner, chief chemist, Colgate & Co., Jersey City, representing the American Manufacturers of Toilet Articles.

Frank A. Blair, New York, president of the Proprietary Association.

M. C. Whitaker, New York, president of the United States Industrial Chemical Co.

R. H. Bond, Baltimore, manager of McCormick & Co., representing the Flavoring Extract Manufacturers' Association.

Dr. Charles L. Reese, chief chemist, E. I. du Pont de Nemours & Co., president of the Manufacturing Chemists' Association.

Prof. J. H. Beal, Urbana, Ill., chairman of the board of trustees, United States Pharmacopœial Convention.

Acceptances of the appointments have been received from all of the members of the committee.

BOOK NOTICES AND REVIEWS.

PUBLICATIONS RECEIVED.

"Traité de Matiére Mèdicale et de Chimie Végétale." Par le Dr. L. Reutter, privatdocent à l'Université de Genève. In eight parts of 112 pages each, with 293 figures. Price of each part, 12 fr. Paris, 19 rue Hartfeuille: J. Ballière et Fils, 1923.

Six parts of above-named work has been received, completing 672 pages of the text. Dr. Reutter accepts the subdivisions of the science adopted by Prof. A. Tschirch. In the first fascicle he defines Materia Medica and Pharmacognosy and discusses the different modes of preparing drugs, Pharmaco-emporia, Pharmaceutical Botany, Zoölogy, Chemistry, etc. In the arrangement the author has followed Eichler's classification, stating his reasons therefor. An extensive history of the subject is given. A chapter deals with microscopical reagents and methods for identifying cell contents, etc. In another chapter methods for examination of the drugs are considered, and processes whereby the constituents may be separated.

In the consideration of the drugs, the botanical description is first given, followed by geographical distribution, collection, the pharmacognosy in general, macroscopically and microscopically, and characteristics of the powdered drugs are described. The determination of constituents, adulteration, incompatibilities and the pharmacy of the drug are fully considered. Comparisons are made of parts of the plants—fruits, seeds, leaves, roots, etc., with those more or less similar and the dissimilarities shown and explained. The space given to the drugs varies from a few lines to a number of pages, according to their importance.

The list of drugs considered is comprehensive, including many of rather infrequent use in medicine, but this is essential for the completeness of a work of this kind. The illustrations, with very few exceptions, are excellent. The only adverse criticism we can offer is that the type matter is too compact; evidently the author's purpose has been to hold down the number of pages, but this objection is in a degree offset by being printed in double columns.

It is certainly a very valuable addition to treatises on Materia Medica. The work evidences not only the scientist, but the presentation of the subjects clearly indicates an acquaintance with the needs of those who require the information for practical application, and instructors in pharmacognosy.

Proceedings of National Association of Boards of Pharmacy of the 19th annual convention, held at Cleveland, Ohio, August 14–15, 1922. 168 pages.

A subject of discussion during the Cleveland meeting of the National Association of Boards of Pharmacy was that relating to the consolidation of boards of pharmacy. The attitude of the Association is reflected in the article by Secretary H. C. Christensen in the April JOURNAL A. PH. A., pp. 346–349. A synopsis of the proceedings is printed in the September number of the JOURNAL, pp. 747–749, and the address of President L. L. Walton will be found on pp. 741–747 of the same issue.

A discussion of interest is the report on the restriction of ownership of retail pharmacies to licensed pharmacists. All the transactions of the meeting are reported and are of more than ordinary interest to all pharmacists.

The next meeting of the National Association of Boards of Pharmacy will be held in Asheville, N. C., during the week of September 3.

Proceedings of the American Conference of Pharmaceutical Faculties of the 23rd annual meeting, held at Cleveland, Ohio, August 14–15, 1922. 148 pages, cloth.

A summary of the proceedings of the American Conference of Pharmaceutical Faculties will be found on pp. 815–816 of the October JOURNAL A. PH. A. The Department of the Conference appears in the monthly issues of the JOURNAL and report on the transactions. The report of the Fairchild Scholarship is printed on pp. 750–752 of the September JOURNAL, and in the same issue, pp. 730–740, will be found the address of Prof. C. A. Dye, that of Hon. Newton D. Baker, on pp. 974–978 of the November number, and a list of Standing Committees is printed in the succeeding issue, p. 1026.

A dinner in honor of Dr. H. H. Rusby, his address, and the lantern slides of schools of pharmacy, prepared and shown by Caswell A. Mayo, were features of the meeting.

The next annual meeting will be held in Asheville, during Convention Week, beginning September 3.

Proceedings of the National Wholesale Druggists' Association of the 48th Annual Meeting,

held at Colorado Springs, October 2–5, 1922. Cloth, 677 pages.

These proceedings have so frequently been reported in these pages, in general outline, that such reference is omitted at this time.

Much of that which concerns the wholesale druggist is of importance to the retail pharmacist, hence the reports of this Association, particularly those relating to business affairs and the Legislative Committee, are of interest and value; that of the latter comprises 60 pages, without taking into the count most interesting discussions thereon. All reports are ably presented and most of them have value for the retailer—those on transportation, insurance, etc.

Sketches of deceased members appear in the book together with half-tones of them, and several pages of half-tones of the officers precede the lists of past and present officers in the fore part of the Proceedings. The President of this year is F. E. Bogart, the Secretary, C. H. Waterbury, and F. E. Holliday is General Representative. The next meeting will be held in Cleveland, Ohio, October 8–11.

Bulletin of the Department of Public Health and Charity, Havana—December issue in Spanish, and numbers 9, 10, 11 and 12 bound in one volume—have been received.

Last year we reported that an annual prize had been formed by the College of Pharmacy of Havana, consisting of a gold medal and a diploma, to be awarded for the best work on a subject to be assigned by the college. This year the proposed subject related to suggestions for the revision of the United States Pharmacopœia. The discussion is particularly welcome because it evidences the close coöperation of our Cuban pharmacists, their friendly and professional interest, and the timely value of the contribution.

The award for this year was made to Dr. José Agustin Simpson, chief of chemistry of the National Laboratory. How well and comprehensively Dr. Simpson studied his subject is evidenced by 50 pages of the *Bulletin*. While not prepared, at this time, to discuss the criticisms and recommendations of Dr. Simpson we desire to express appreciation of the interest and helpfulness and congratulate him as the recipient of a well-earned award. The contribution referred is printed both in Spanish and English.

The Wulling Testimonial, a reprint from the "Proceedings of the Minnesota Pharmaceutical Association, 1917." This reprint contains, besides an account of the Northwestern Branch. A. Ph. A., meeting, a report of the Wulling Testimonial Dinner, addresses delivered on that occasion, letters and messages received and a sketch of the Dean. The latter was elected President of the American Pharmaceutical Association in 1916, and the occasion was to honor him and express appreciation of his services locally, in the State, and nationally. Reference to the event was made in the Journal A. Ph A. for May 1917, page 509.

Proceedings of New Jersey Pharmaceutical Association of the 52nd annual session, held at The Hotel Alamac, Lake Hopatcong, N. J., June 13–15, 1922. The book contains also the constitution and by-laws, roll of membership, the Pharmacy Act of New Jersey, other laws, list of registered pharmacists, the Traveling Men's Auxiliary, and the Women's Auxiliary.

Proceedings of Pennsylvania Pharmaceutical Association of the 45th annual session, held at Buena Vista Spring Hotel, June 20–22, 1922. Besides the proceedings of the convention this number also contains the constitution, by-laws, roll of members, and the roll of members of the Traveling Men's Auxiliary. It contains also an abstract of the tentative draft of the bill proposed for consolidation of boards in Pennsylvania. An excellent half-tone of President Josiah C. Peacock is the frontispiece, and several pages of half-tones introduce the officers of the present year.

Plates in Color of Drug and Perfume Plants of France have been issued by Office National des Matieres Premieres pour la Droguerie, la Pharmacie, la Distillerie et la Parfumerie, 44, Rue de Bellechasse, Paris (VII). The price of a series of eight of these leaflets is 25 cents.

Green Book Directory for Buyers and Sellers for 1923. This well and favorably known annual is published by the *Oil, Paint and Drug Reporter*. The present issue contains over 500 pages and the price is $2.50. The arrangement has been improved and responsive to the growth of the industries more pages have been added.

Red Book, Part II, published by the *Druggists' Circular*, follows former editions—Section A lists drugs, chemicals, galenicals, etc.; B, biological products with names and addresses of their manufacturers; C, proprietary preparations, medicinal, toilet and miscellaneous; D is a directory of manufacturers and proprietors of the foregoing.

CONFERENCE BULLETIN NO. 3—BIOGENESIS OF OIL OF PEPPERMINT.

Since the appearance of the second bulletin,* the following contributions have been received.

From Dr. C. Kleber, Passaic, N. J., have come two specimens of piperitone.

On February 2nd there were received from A. M. Todd & Co., 120 lbs. of forerunnings representing 12,000 lbs. of peppermint oil. We sincerely appreciate the efforts of Mr. N. R. Mueller, chemist for Todd & Co., who arranged to place this material at our disposal.

On February 26 we received from Dr. A. R. Penfold, F.C.S., Sidney, N. S. W., both purified and commercial samples of piperitone, and oil of *Eucalyptus dives*.

We feel greatly indebted to those who have so generously contributed to the progress of our researches.

At the conference of February 23, Dr. R. E. Kremers reported on the biochemical significance of experimental results recently obtained. Special attention is being given to the occurrence of isomeric menthenones in various oils. In the cohobated (water-soluble) oil of peppermint, a menthenone had been previously found which was identified with pulegone; semicarbazone m. p. 169–70°. A repetition of this work with the 1922 oil yielded a ketone whose semicarbazone melted at 215°. So far it has been impossible to differentiate it from piperitone semicarbazone, although its identity therewith is perhaps not fully established. The much larger amount of 1922 original oil is being examined by a somewhat different technique and the presence of a menthenone has been indicated. The arvensis mint oil investigated some time ago was at first thought to contain only pulegone, but a very careful fractionation of a large amount of semicarbazone revealed a second compound melting at 136–40° C. This agrees most nearly with the semicarbazone of menthene-4, one-3. Experiments are in progress to prepare the latter and thus prove the identity.

Taking into consideration the frequent occurrence of pulegone or its isomers in the Mentha species and the fact that an unsaturated ketone accompanied the menthone and menthol in peppermint oil, it seems likely that the latter are derived from the former. This supposition is supported by the fact that pulegone and menthol are the only compounds attaining a preponderant percentage. The former forms 80–90 per cent of *M. arvensis* var. *canadensis*, for example, and the latter 80 or more per cent. of the Japanese peppermint oil, said to be derived from an *arvensis* type.

* JOURNAL A. PH. A., March 1923, p. 285. See also December number, 1922, p. 1080.

BOOK REVIEWS.

Lehrbuch der Bakteriologie. Von Dr. Ludwig. Heim, Prof. und Direktor des hygienisch-bakteriologischen Instituts der Universität Erlangen. 6. und 7. neu bearbeitete und erweiterte Auflage. Mit 240 Abbildungen und 106 Lichtbildern auf 16 Tafeln. Lex. Octavo, 726 pp. $3.60.

This excellent text is divided into five chapters as follows:

I, General Methods; II, Determination of Bacteria; III, Bacteriological Diagnostic; IV, Microphotography; V, Bacteriological Laboratory.

An appendix brings the sixteen plates containing 106 microphotographs of different bacteria with full explanations. Prof. Heim's book is truly a masterwork!

Anleitung zum Studium der Chemischen Reaktionen und der qualitativen Analyse. Von Dr. Fr. Fichter, Prof. Univ. Basel. 3 Auflage. Octavo, 120 pp. 66 cents.

The two parts of this book treat the Qualitative Reactions of the most important cations and anions and Tables for Quantitative Analysis. The book is interleaved and is well suited for pharmaceutical students.

Qualitative Pharmazeutische Analyse. Eine Anleitung fur Studierende der Pharmazie und Apotheker. Von Dr. L. Rosenthaler, Prof. Univ. Bern. 41 Abbildungen. Octavo, 192 pp. $1.20.

The preface of the book begins with the following words: "The pharmacist should be able to recognize simple medicaments and to determine the chief constituents in mixtures." Truly a sign of the high standard in German-speaking countries from which we can take a lesson.

The author, Prof. Dr. Rosenthaler of the University of Bern, is well known in pharmacy, owing to his many valuable contributions to pharmaceutical literature. The methods employed are not only chemical but also microchemical and physical, as, f. i., flame test. The 41 illustrations show excellent photographs of crystals. The subject of micro-chemistry seems to gain in importance and deserves attention. The book is a "multum in parvo," a true qualitative pharmaceutical analysis which we can highly recommend to students and pharmacists. This book in the laboratory will be a quick and ready reference on many occasions.

OTTO RAUBENHEIMER, PH. M.